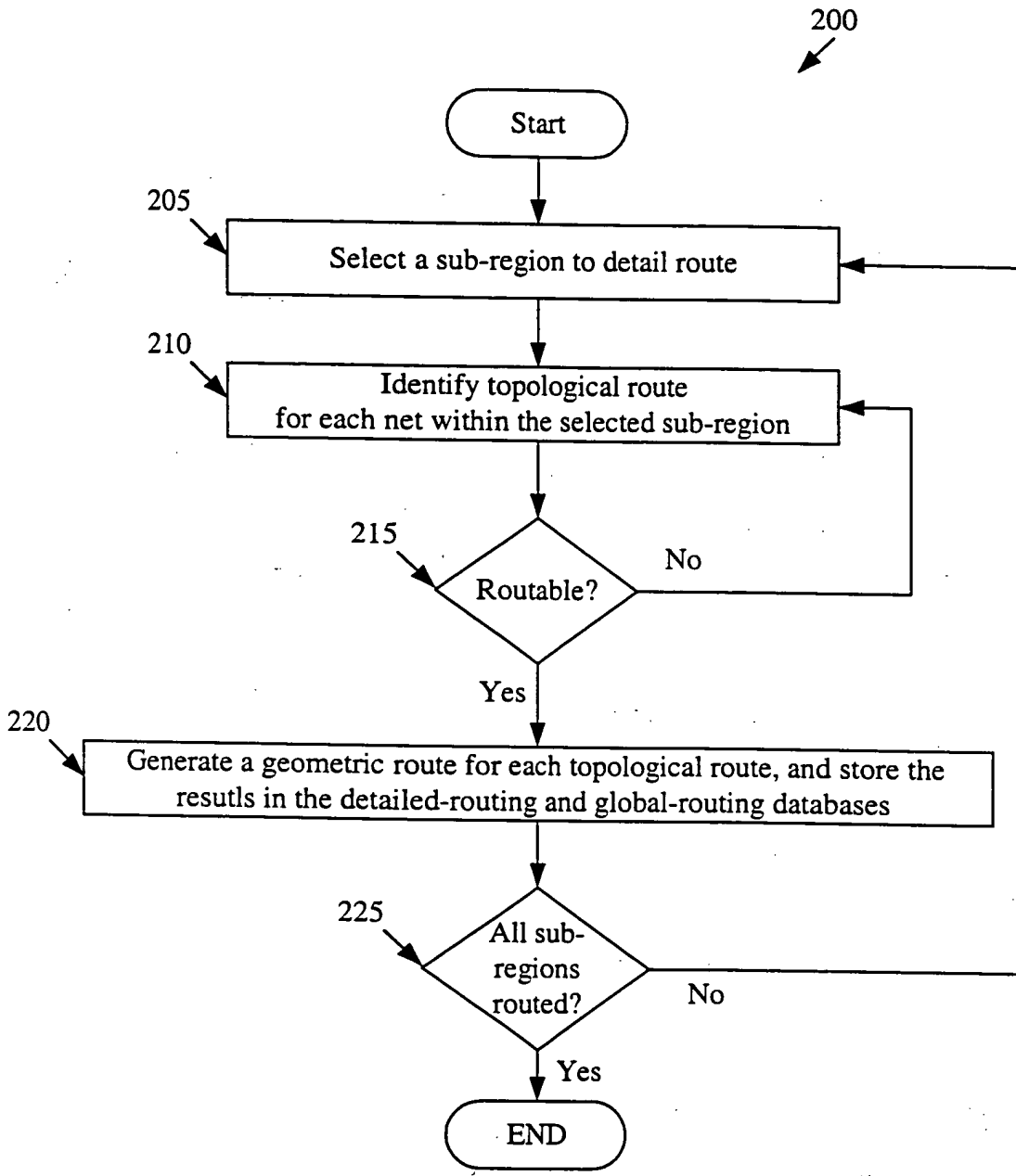


Figure 1



**Figure 2**

2011-09-01

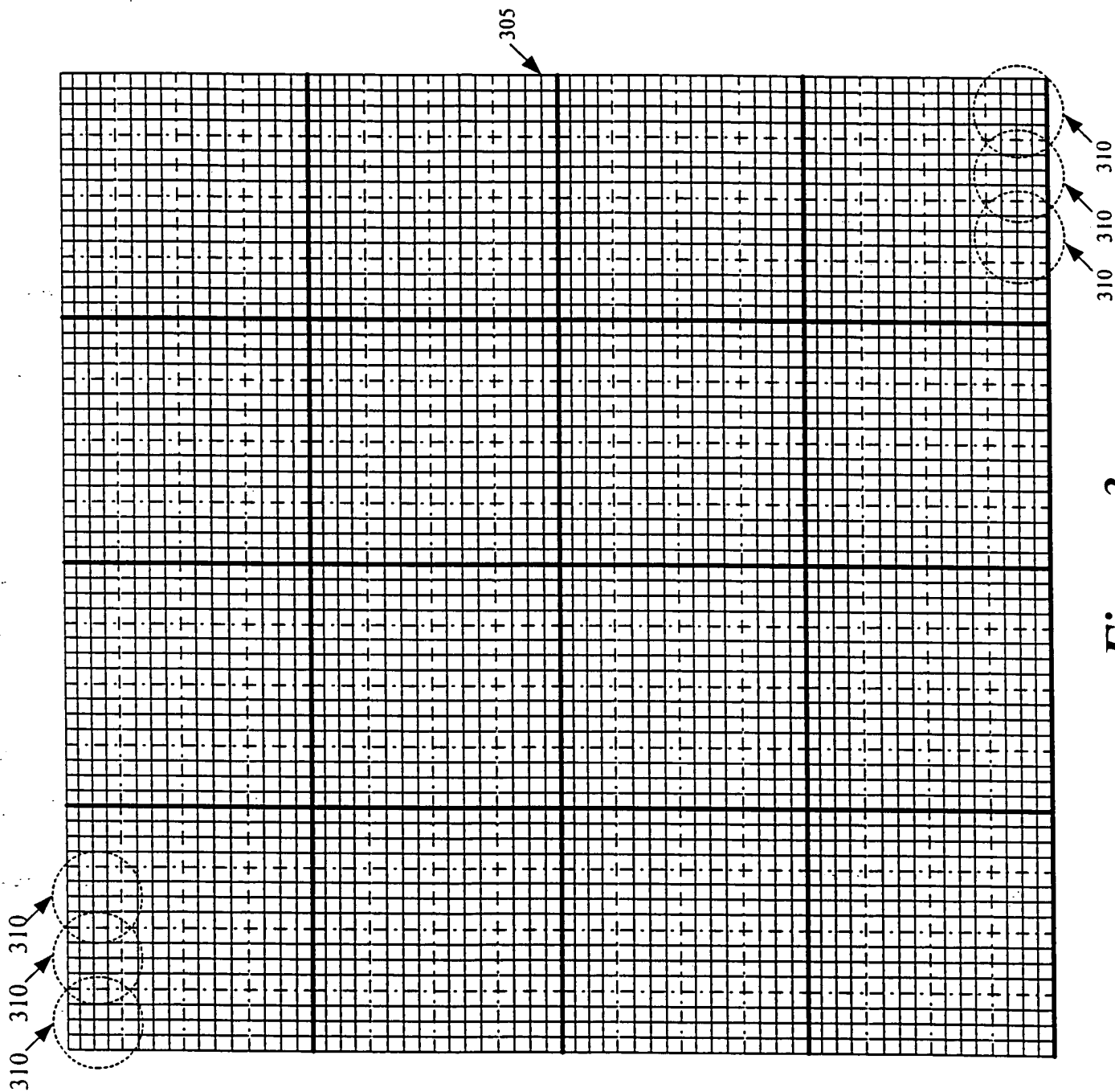


Figure 3

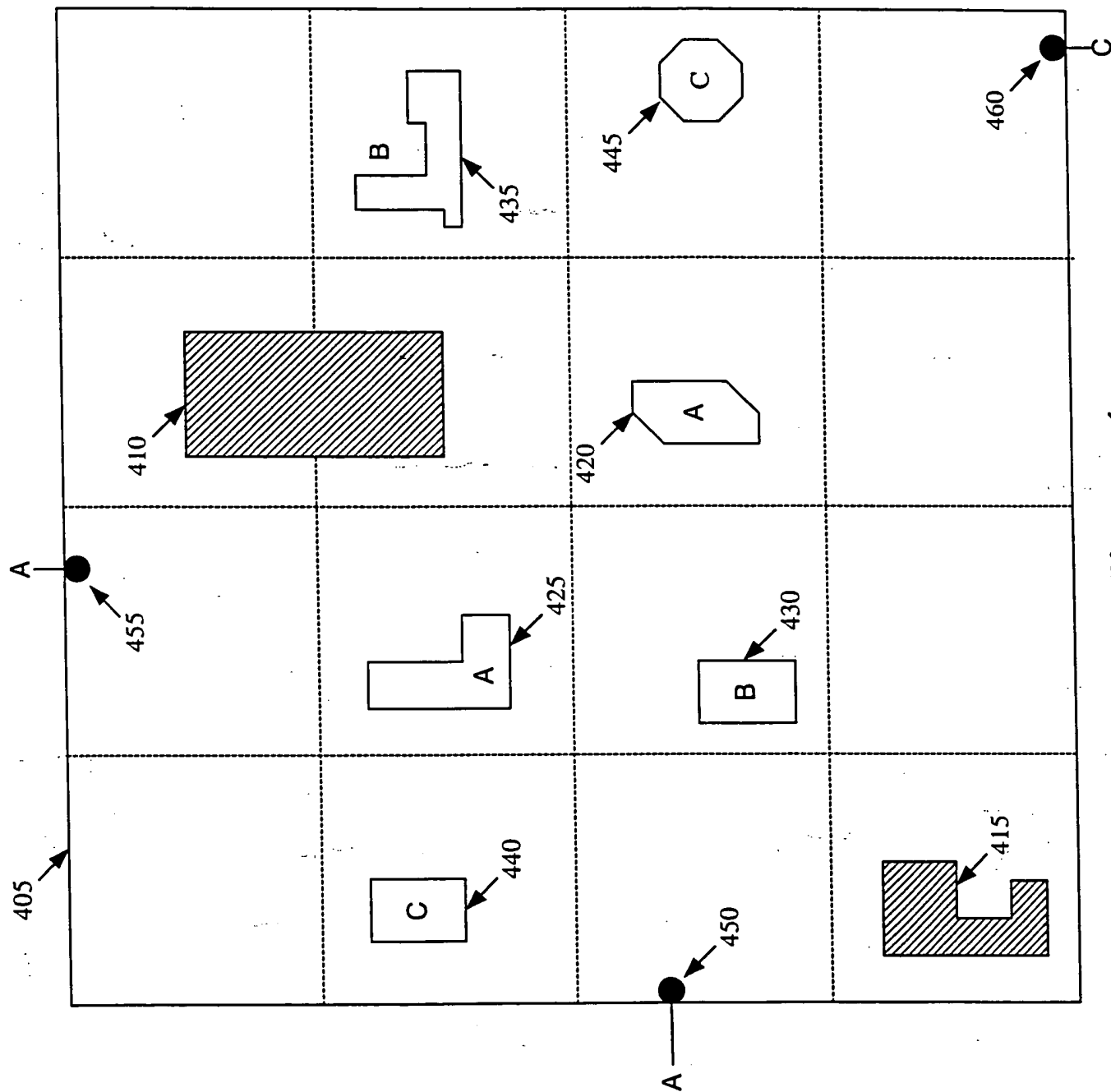
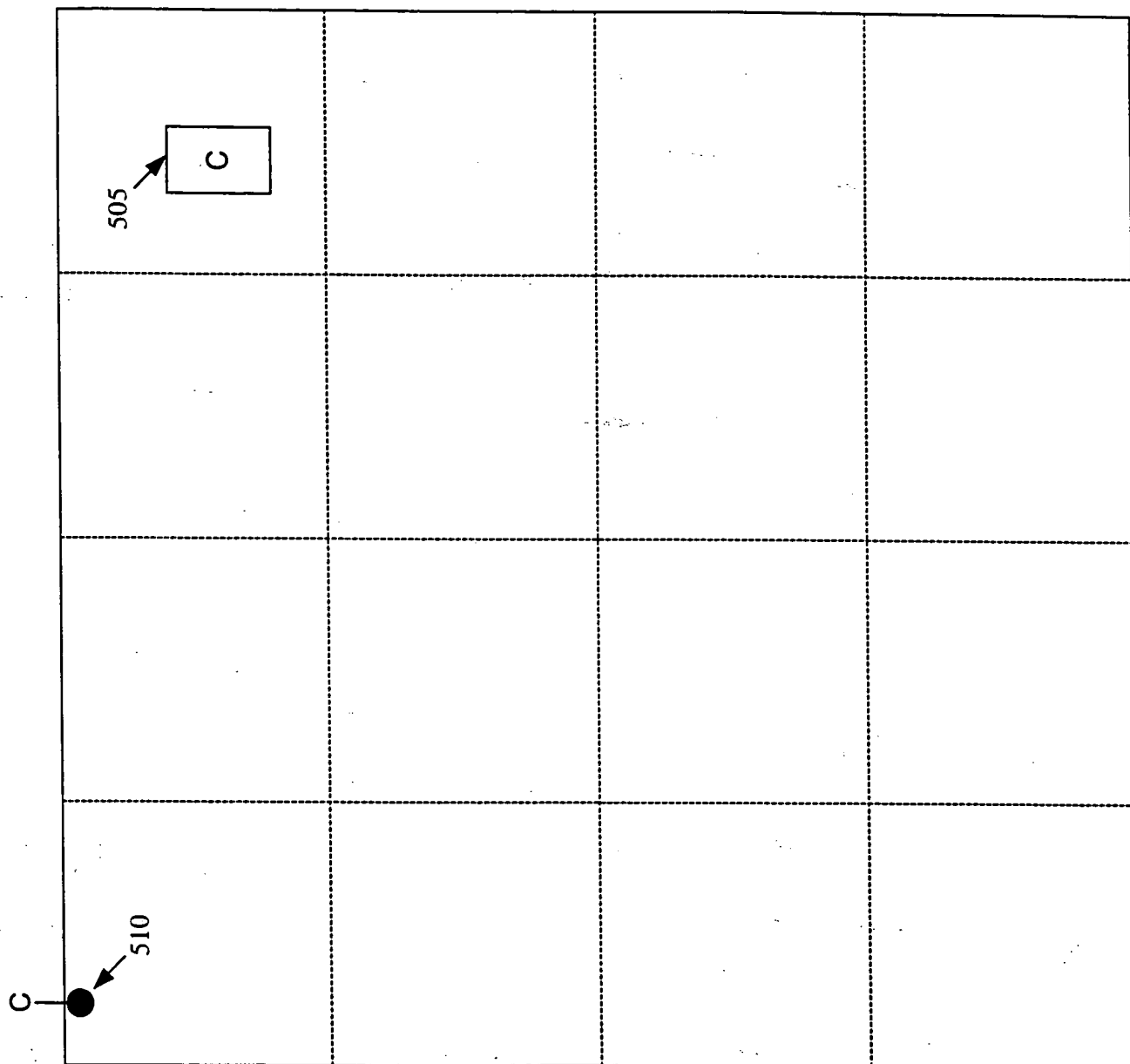


Figure 4



*Figure 5*

```
-List of Geometries
--Each Geometry including a sequence of points & layer assignment
-Bounding box of the region
-Array of layer properties
--Minimum wire size
--Minimum spacing
--Via sizes
--Cost/Unit
-Netlist specifying a number of nets
--Each net specifying a set of pins
--Each pin specifying a set of ports
--Each port specifying a set of geometries
```

*Figure 6*

```
-List of Geometries
--Each Geometry including a sequence of points & layer assignment
--List of connection nodes inside each pin geometry
-Bounding box of the region
-Array of layer properties
--Minimum wire size
--Minimum spacing
--Via sizes
--Cost/Unit
-Netlist specifying a number of nets
--Each net specifying a set of pins
--Each pin specifying a set of ports
--Each port specifying a set of geometries
-For each layer, a graph specifying
--Nodes
--Edges
--Faces
```

*Figure 7*

Face
<ul style="list-style-type: none"><li>-Reference to 3 edges</li><li>-Reference to 3 nodes</li><li>-Up to two references for up to two face item</li></ul>

800

Edge
<ul style="list-style-type: none"><li>-Two references for up to two faces of the edge</li><li>-Capacity</li><li>-Flow</li><li>-Constrained</li><li>-Linked list of items on the edge starting with one of the edge's nodes and ending with its other node</li></ul>

900

Figure 8

Figure 9

Node
<ul style="list-style-type: none"> <li>-Net Identifier</li> <li>-One or more planar-path references to adjacent topological items in the same planar path</li> <li>-A pair of via-path references to up and down topological via items</li> <li>-A references to list of edges connected to the node</li> <li>-For each edge, an edge reference to the next or previous topological item on the edge</li> <li>-A reference to the geometry of the node</li> <li>-Vertex number identifying the vertex of the geometry</li> <li>-Location of the node</li> </ul>

1000

Figure 10

Edge Item
<ul style="list-style-type: none"> <li>-Reference to its edge</li> <li>-Net Identifier</li> <li>-A pair of planar-path references to adjacent topological items in the same planar path</li> <li>-A pair of edge references to the next and previous topological item on the edge</li> </ul>

1100

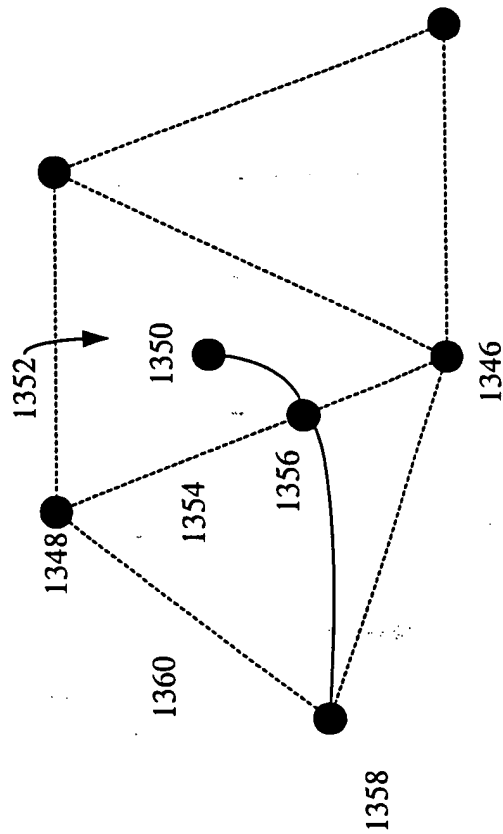
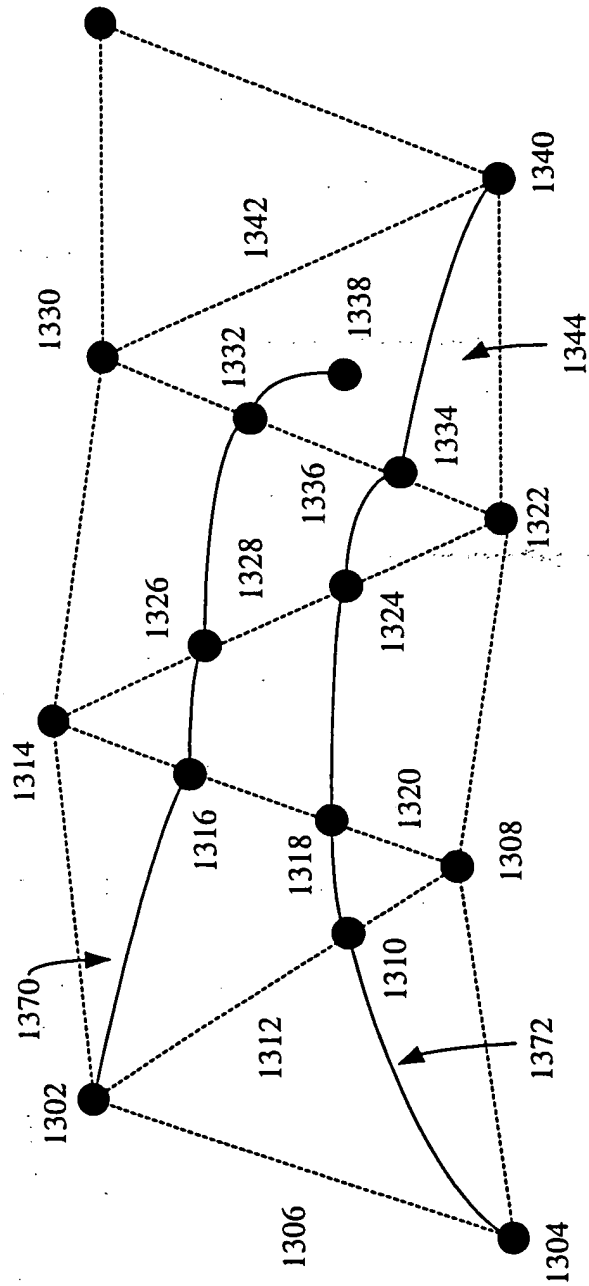
Face Item
<ul style="list-style-type: none"> <li>-Reference to its face</li> <li>-Net Identifier</li> <li>-Up to 3 planar-path references for adjacent topological items in the same planar path</li> <li>-A pair of via-path references for up and down topological via items</li> <li>-Bounding polygon that defines legal face item locations</li> <li>-Constraining Points and Distances</li> </ul>

1200

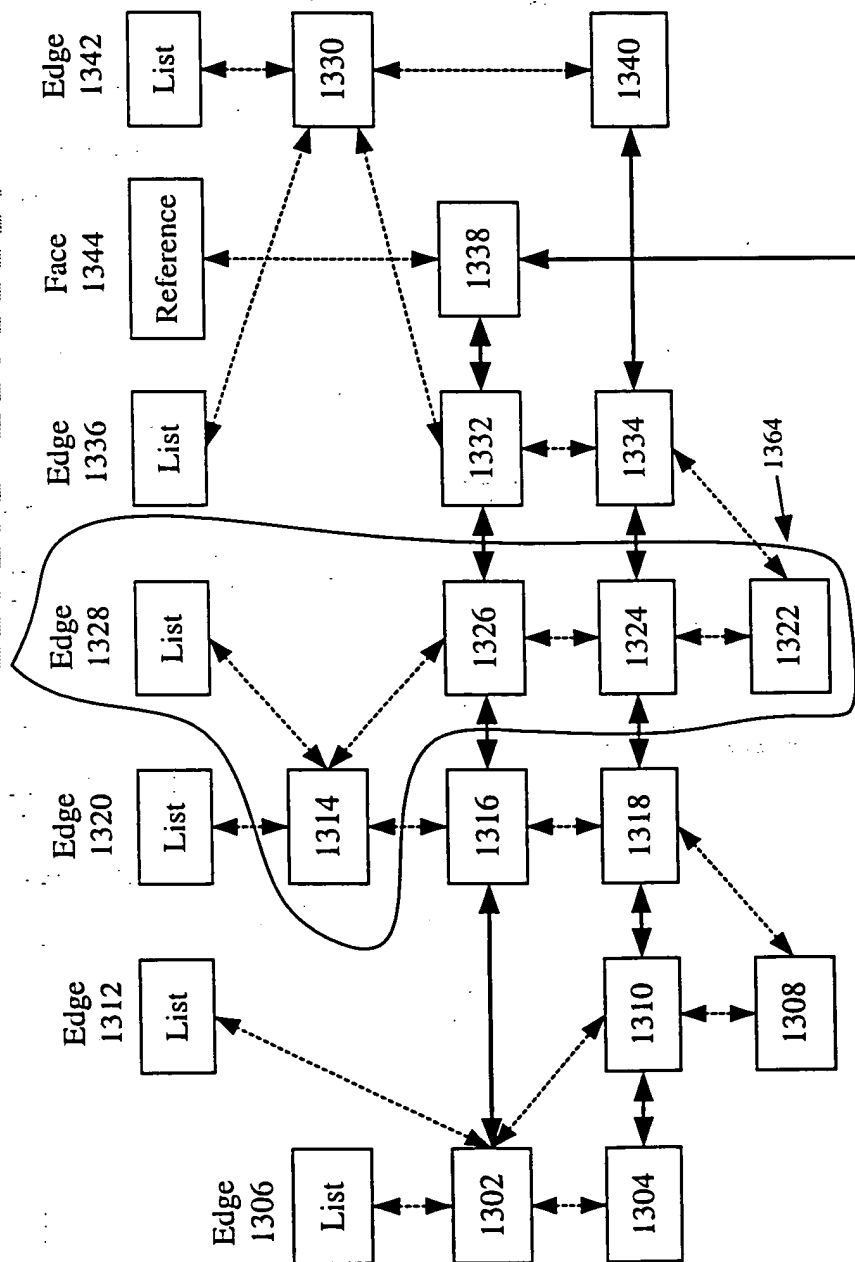
Figure 11

Figure 12

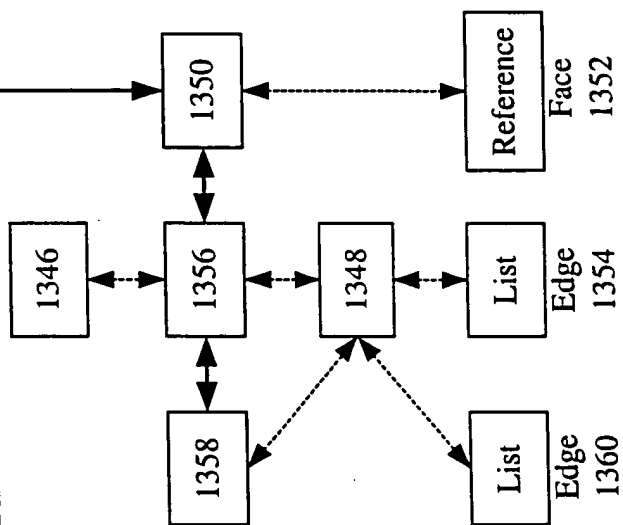




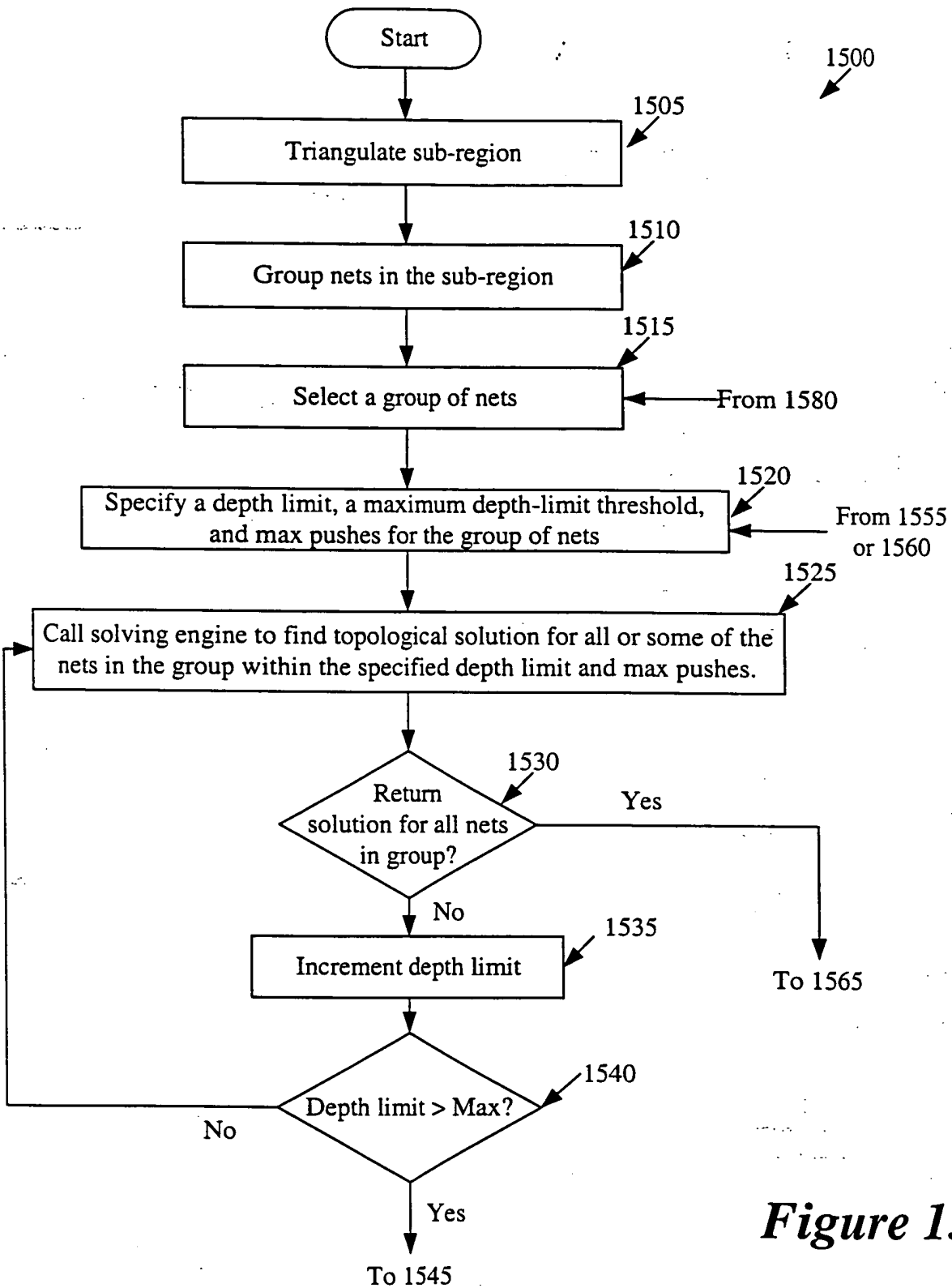
**Figure 13**



### Layer 3

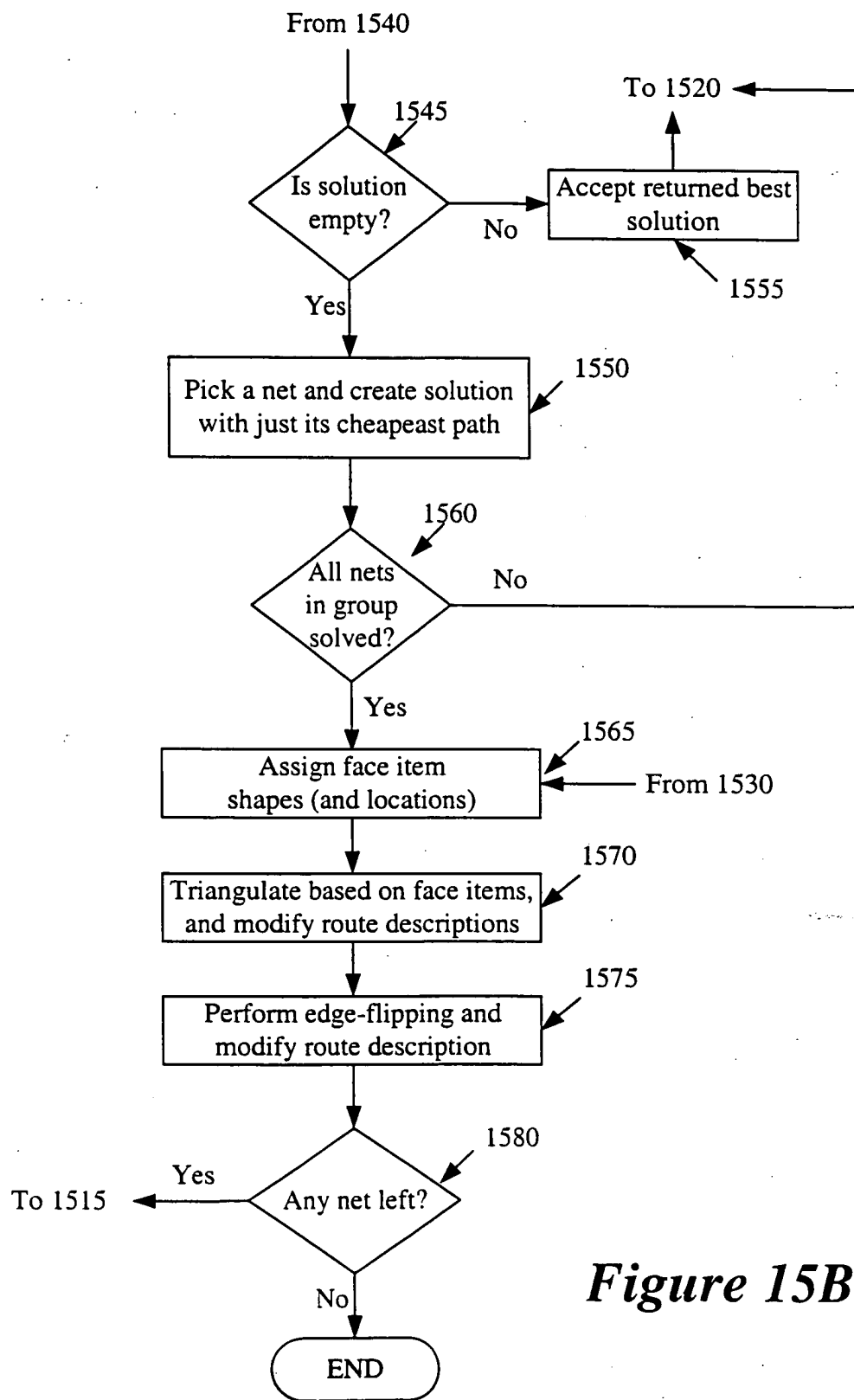


## Figure 14

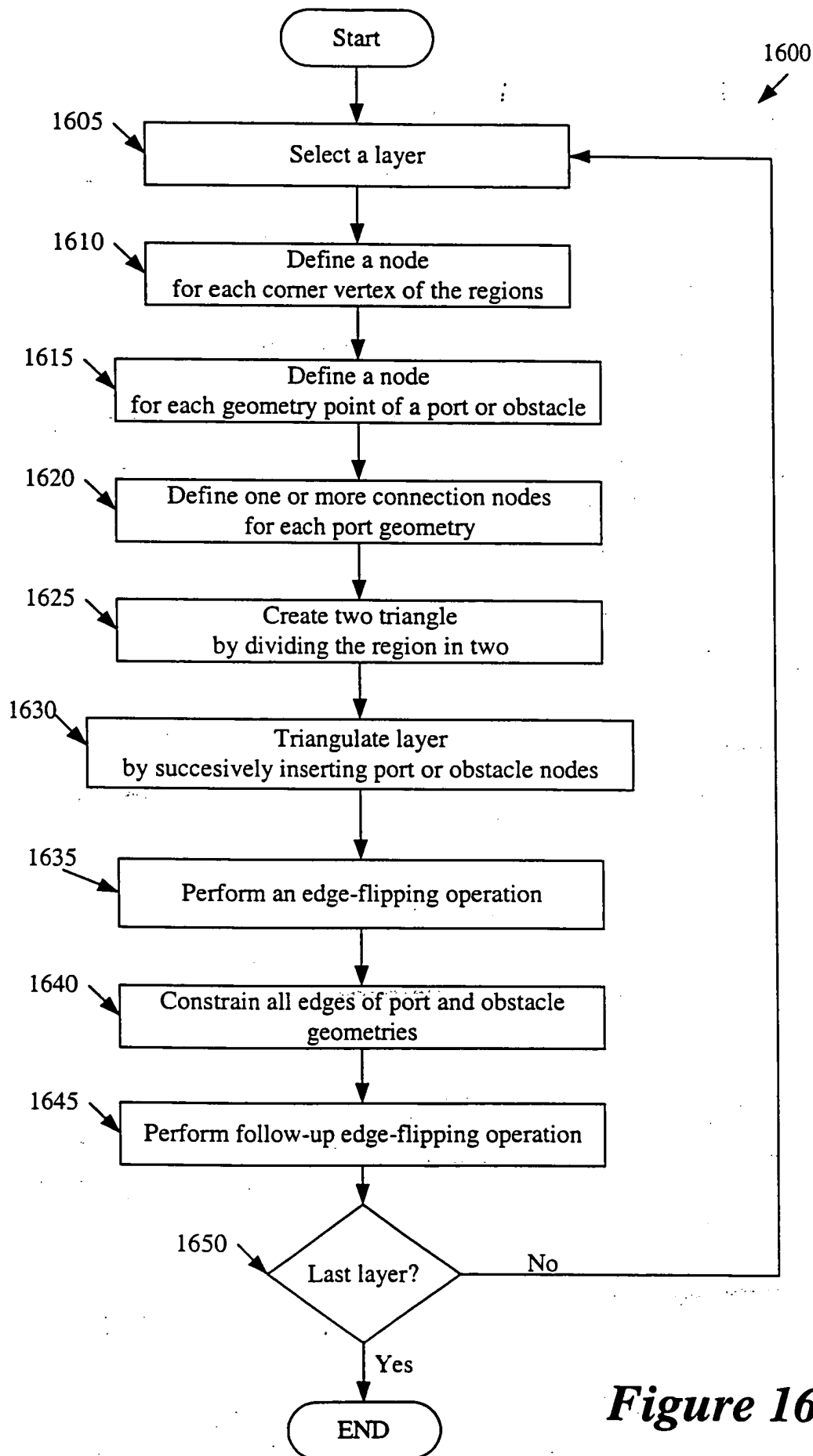


**Figure 15A**

**Figure 15:** Figure 15A  
Figure 15B



**Figure 15B**



**Figure 16**

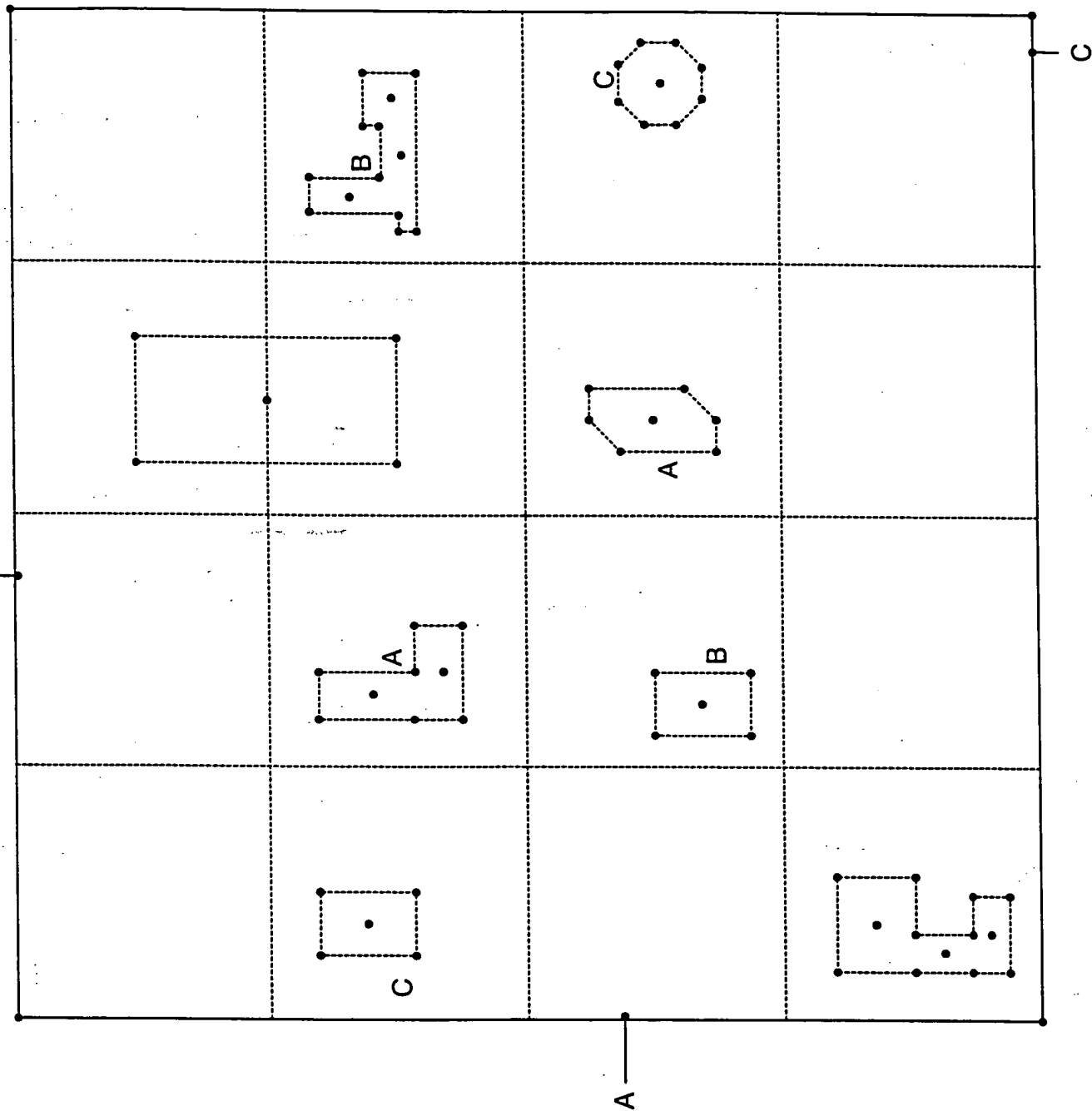


Figure 17

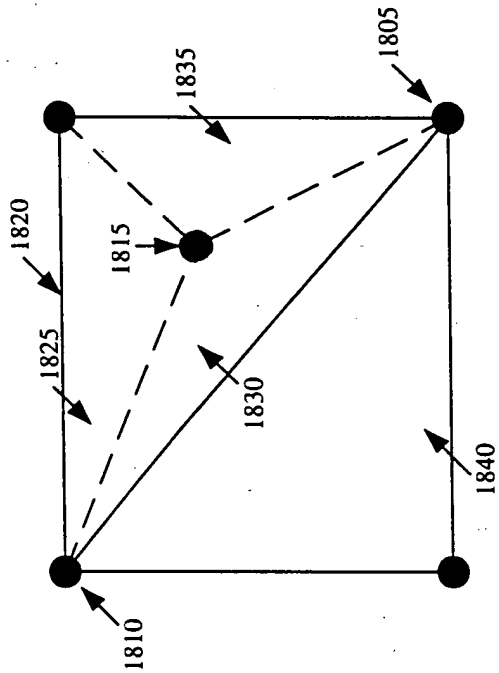


Figure 18

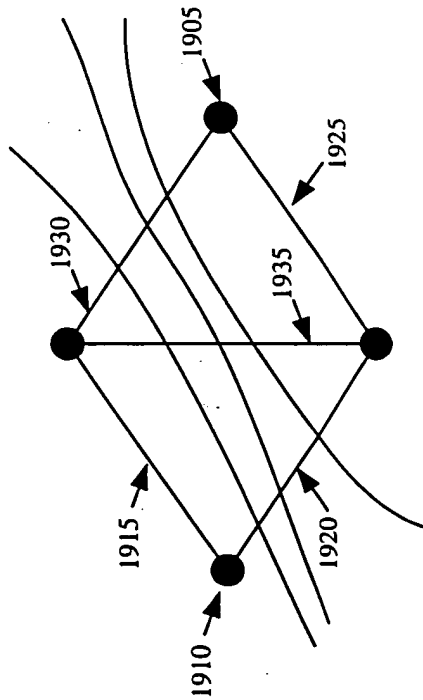


Figure 19

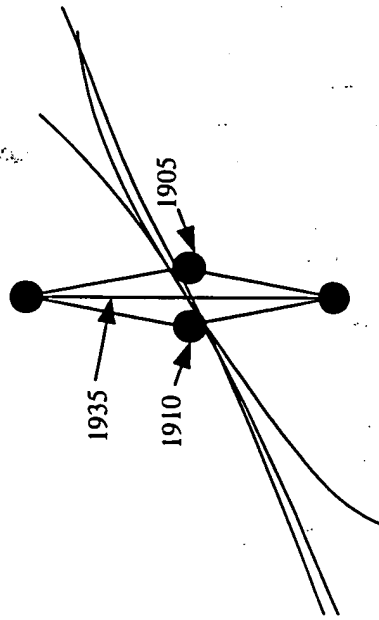


Figure 20

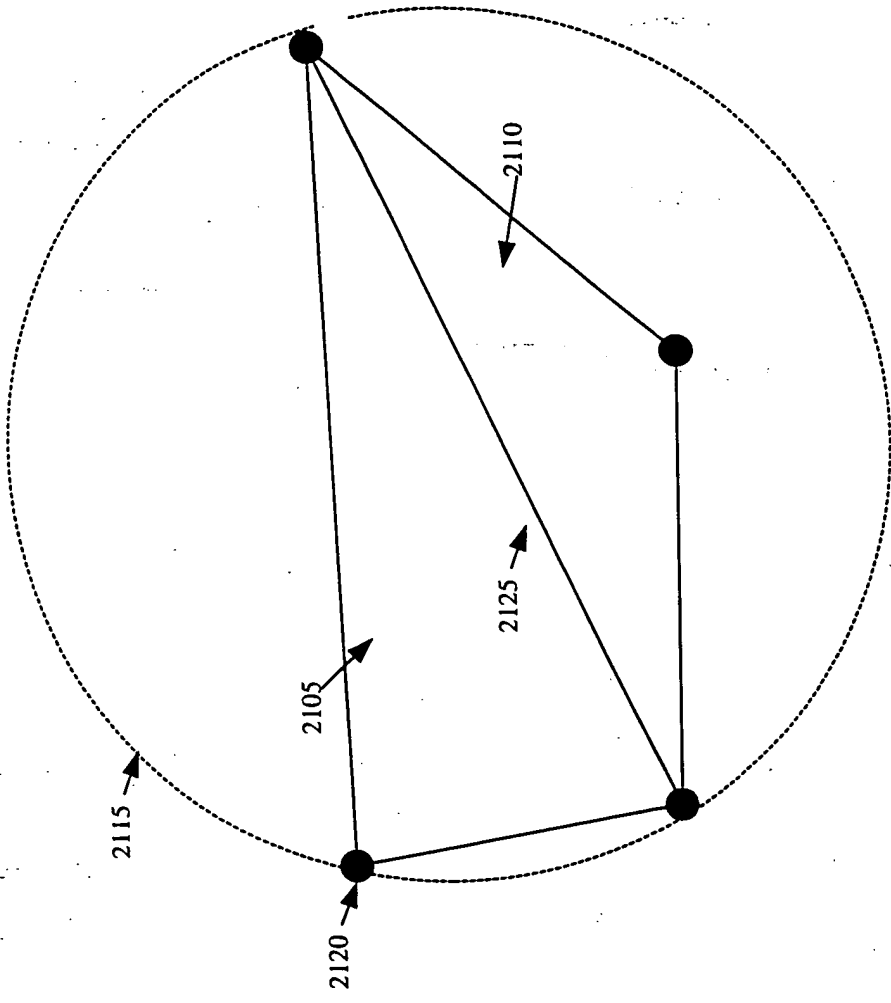


Figure 21

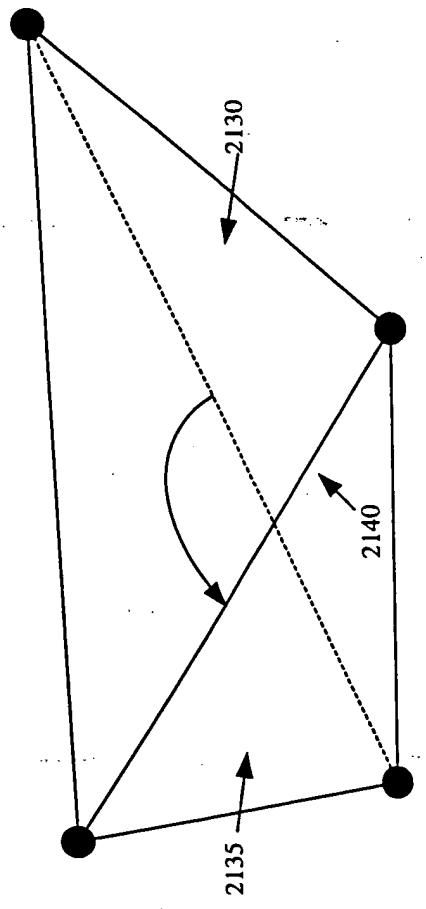


Figure 22



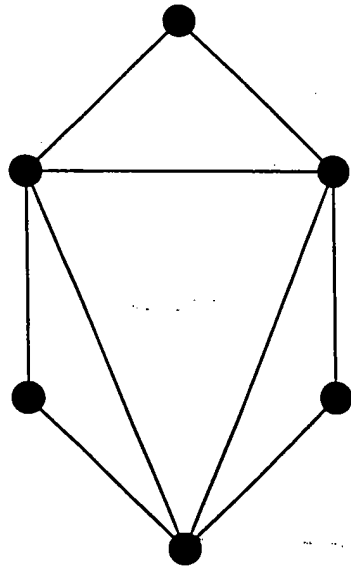
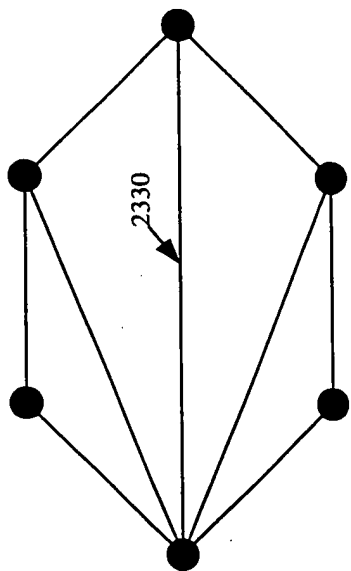
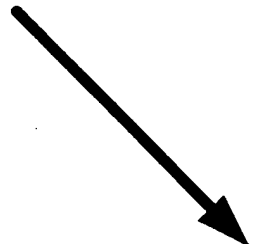
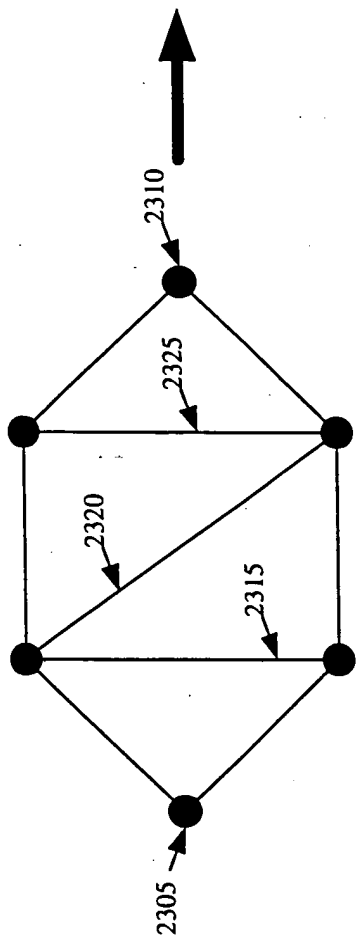
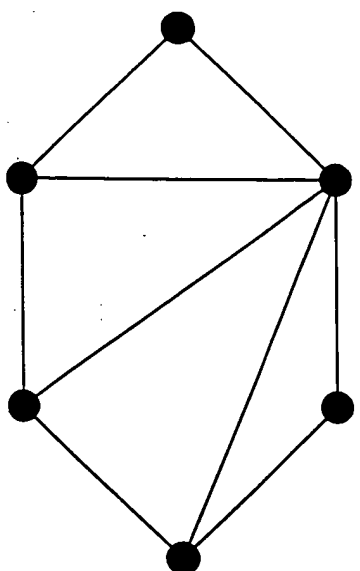


Figure 23

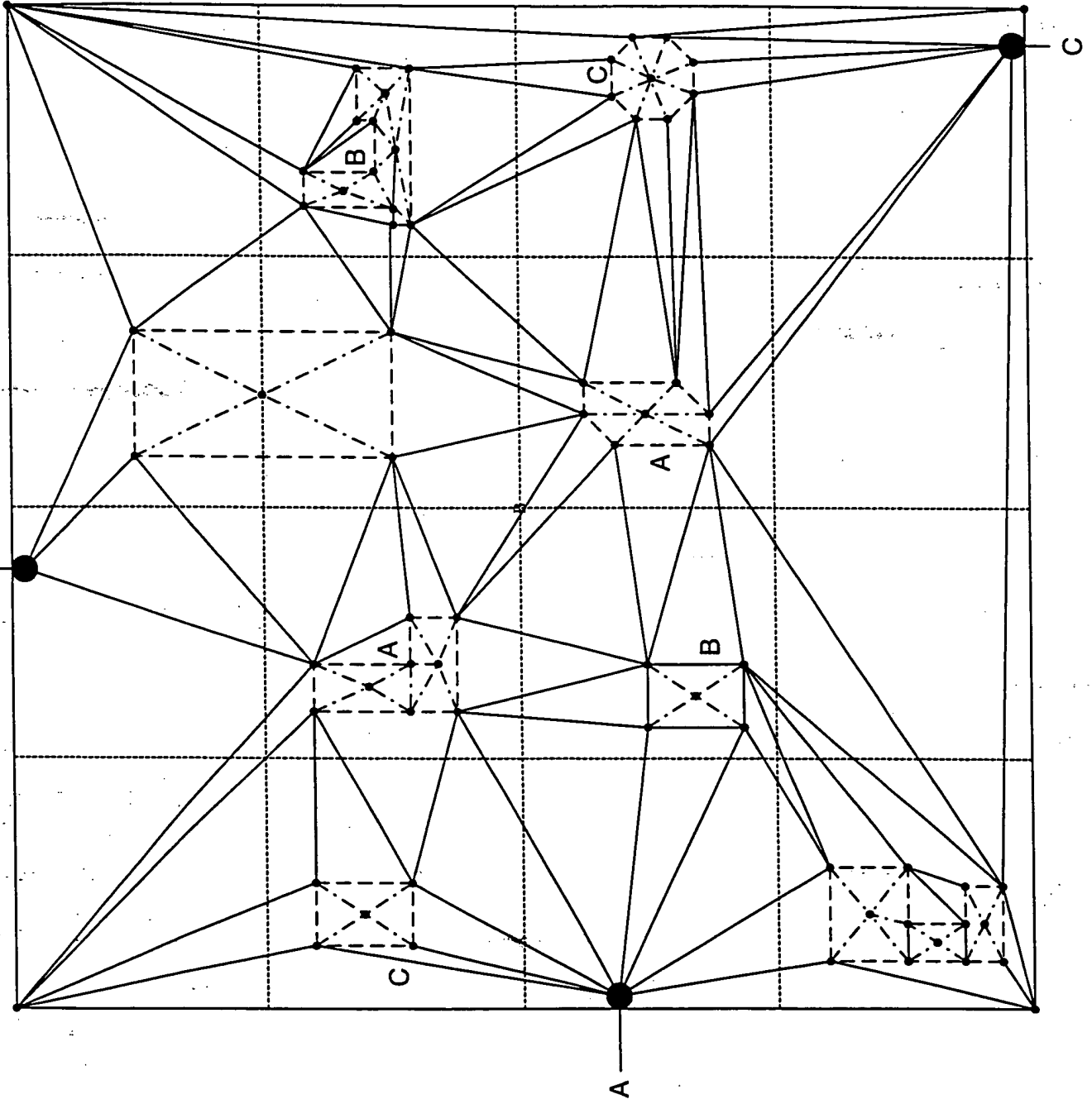
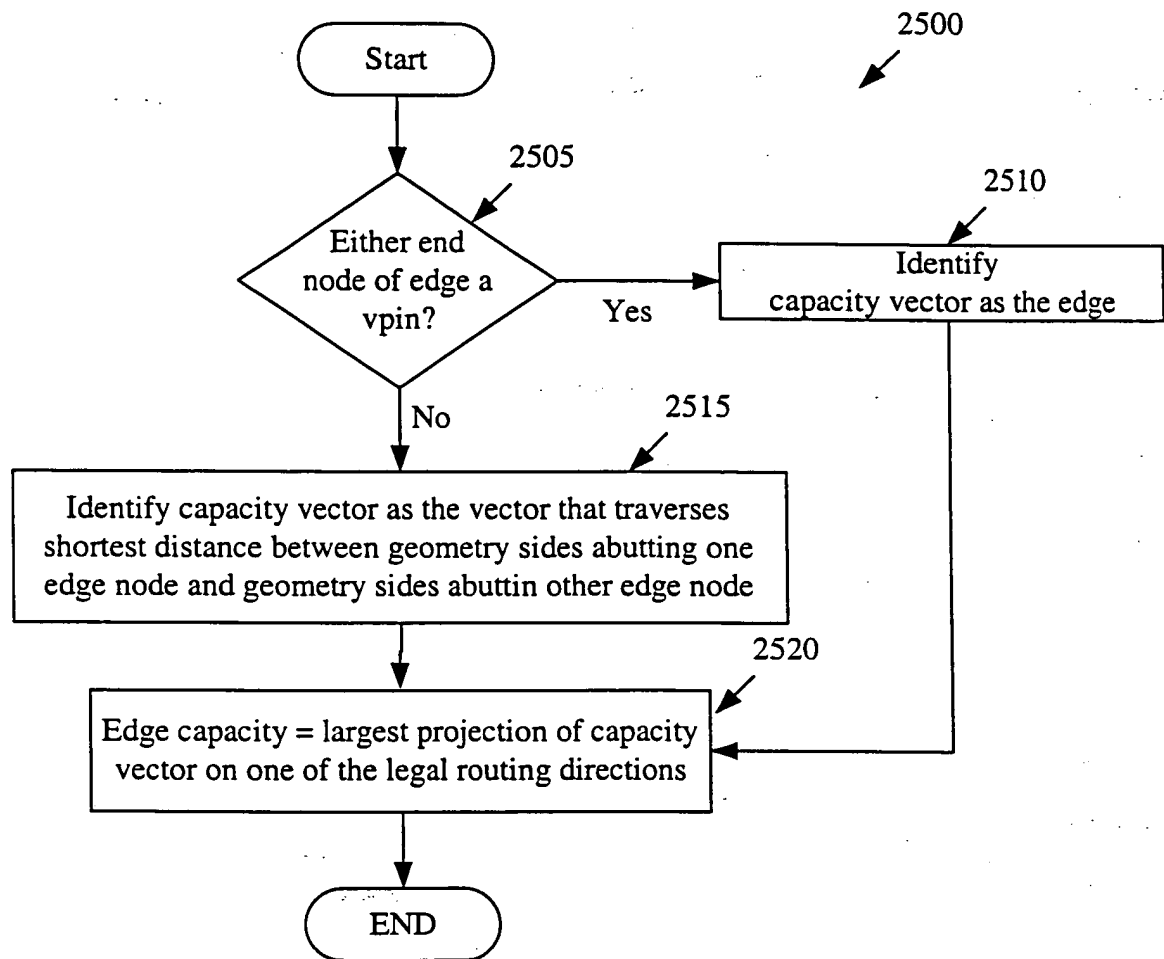


Figure 24



**Figure 25**

2016-10-26 09:00

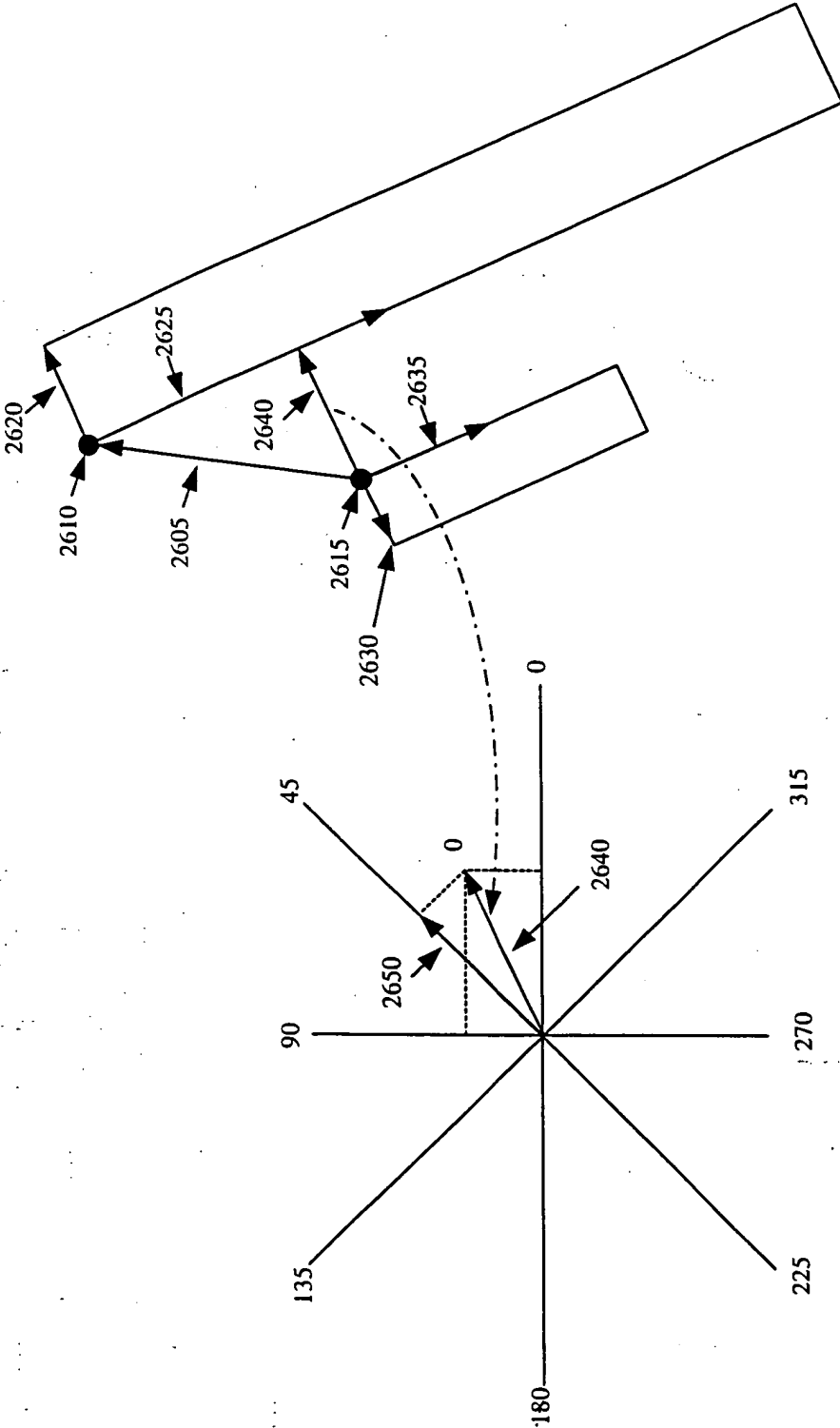


Figure 26

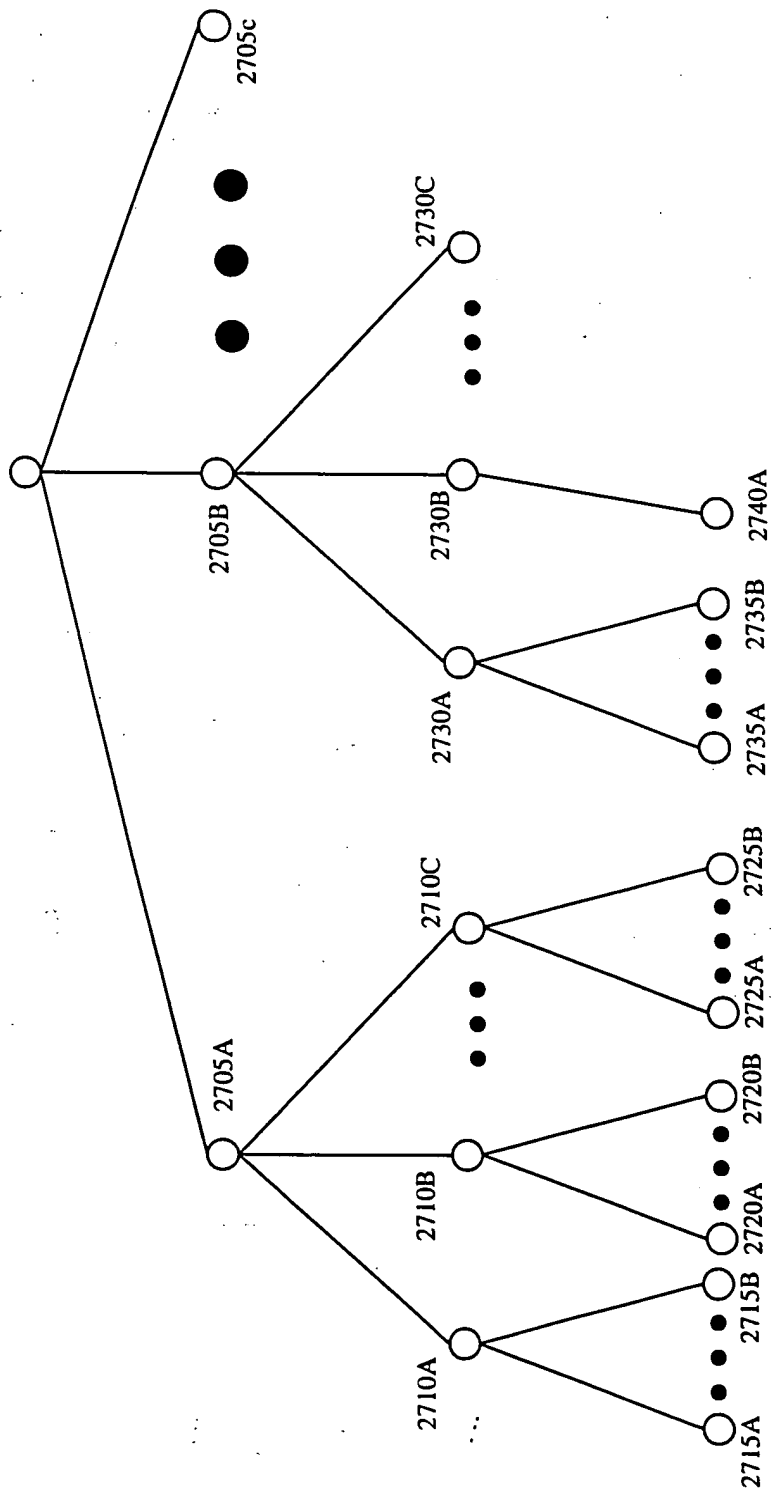
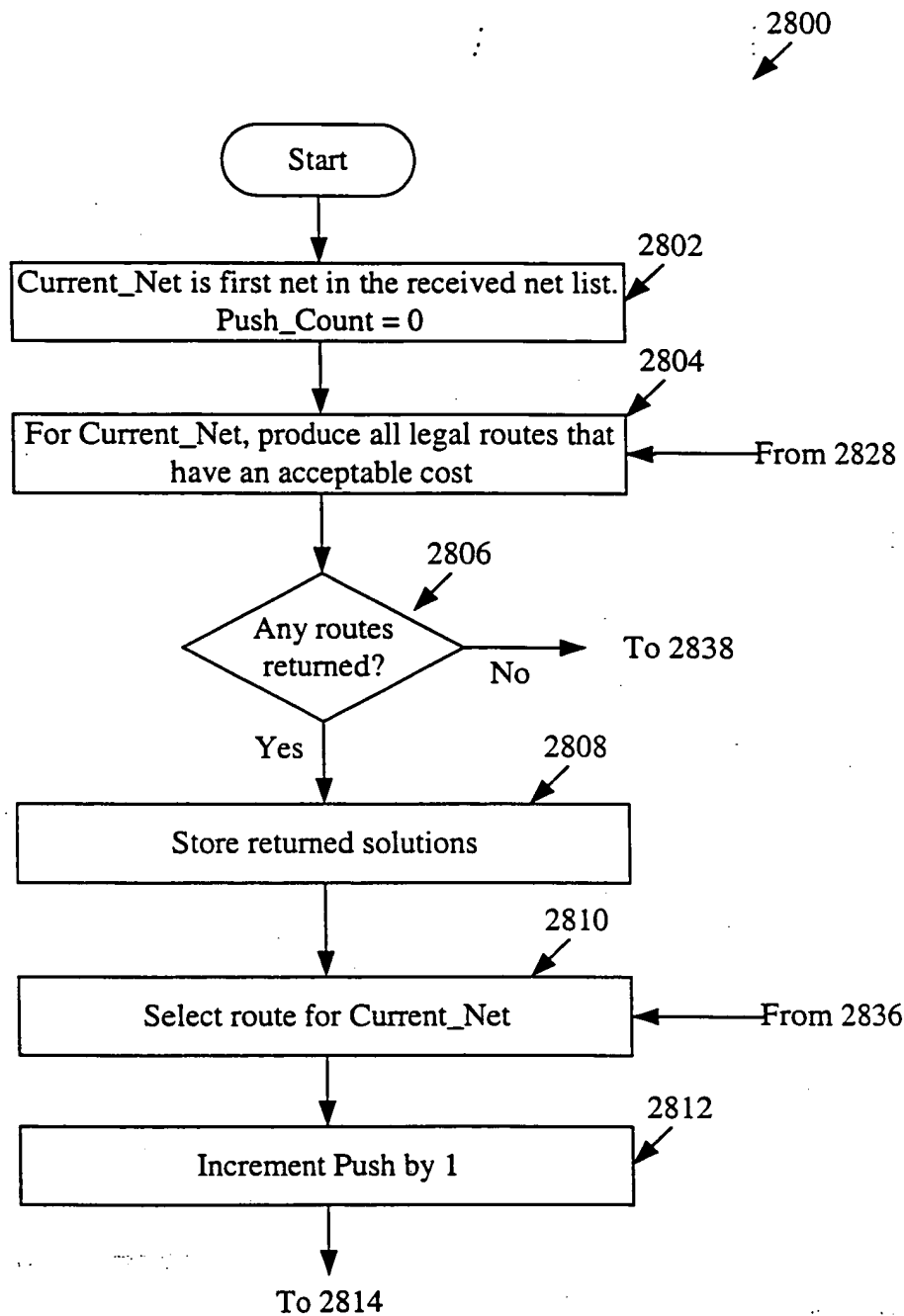
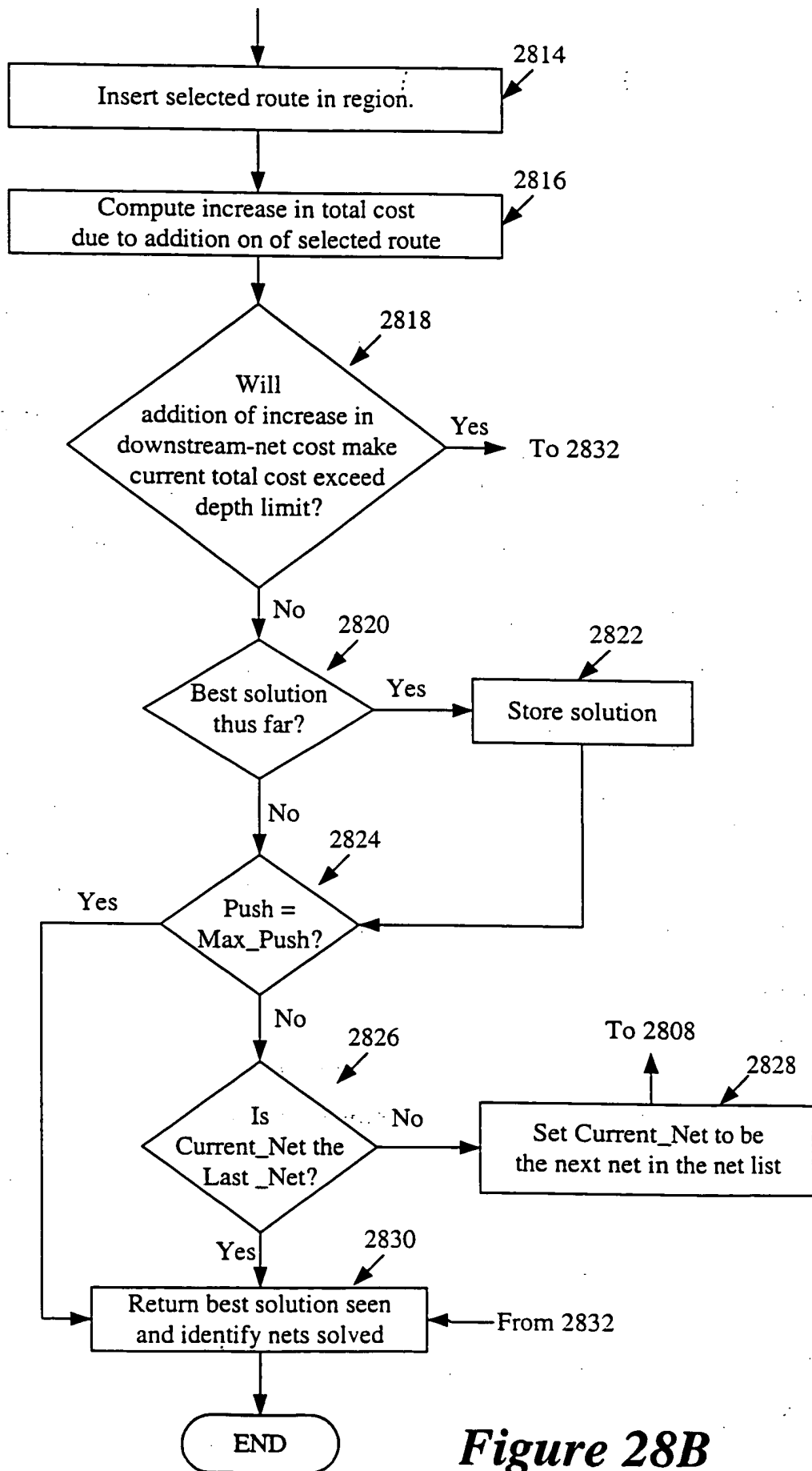


Figure 27

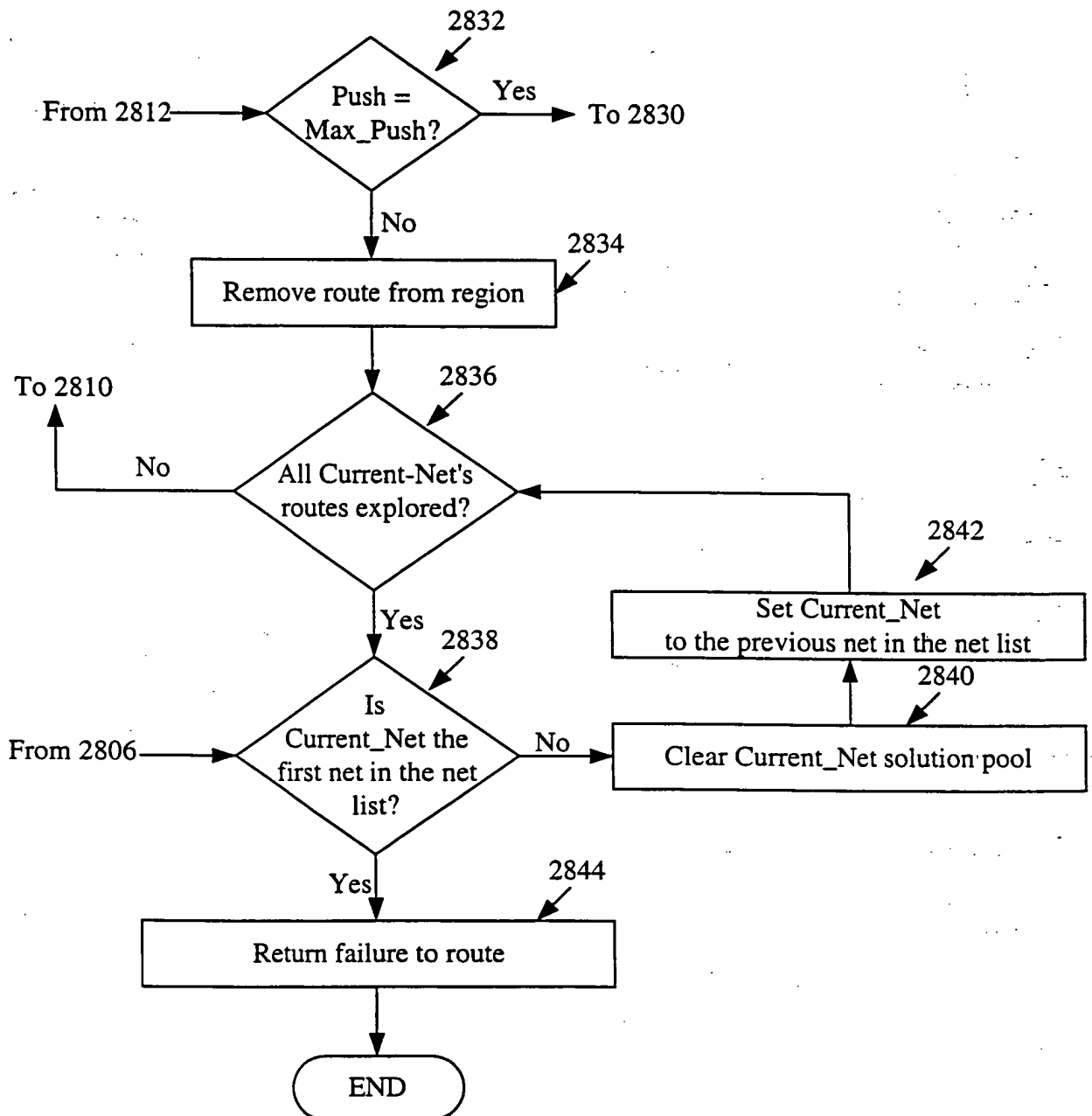


**Figure 28A**

**Figure 28:** Figure 28A  
Figure 28B  
Figure 28C

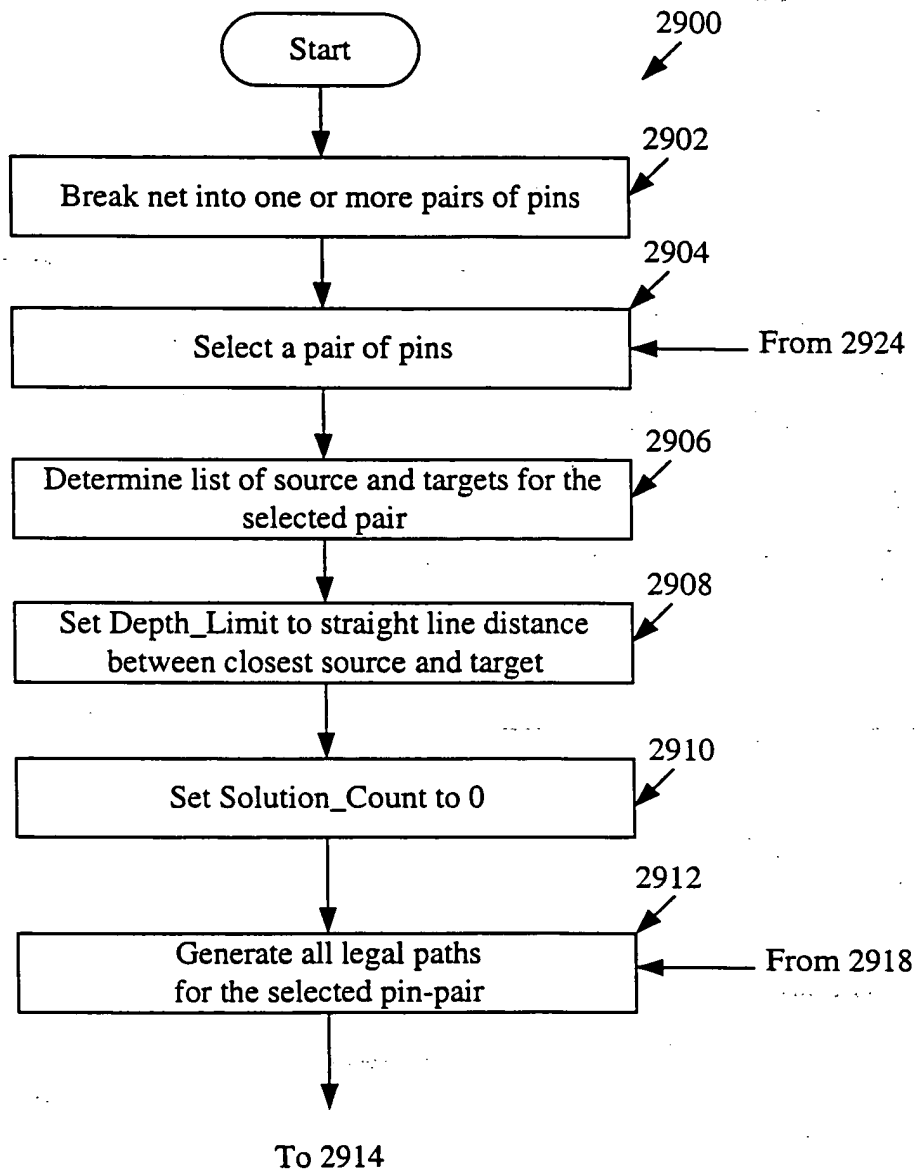


**Figure 28B**



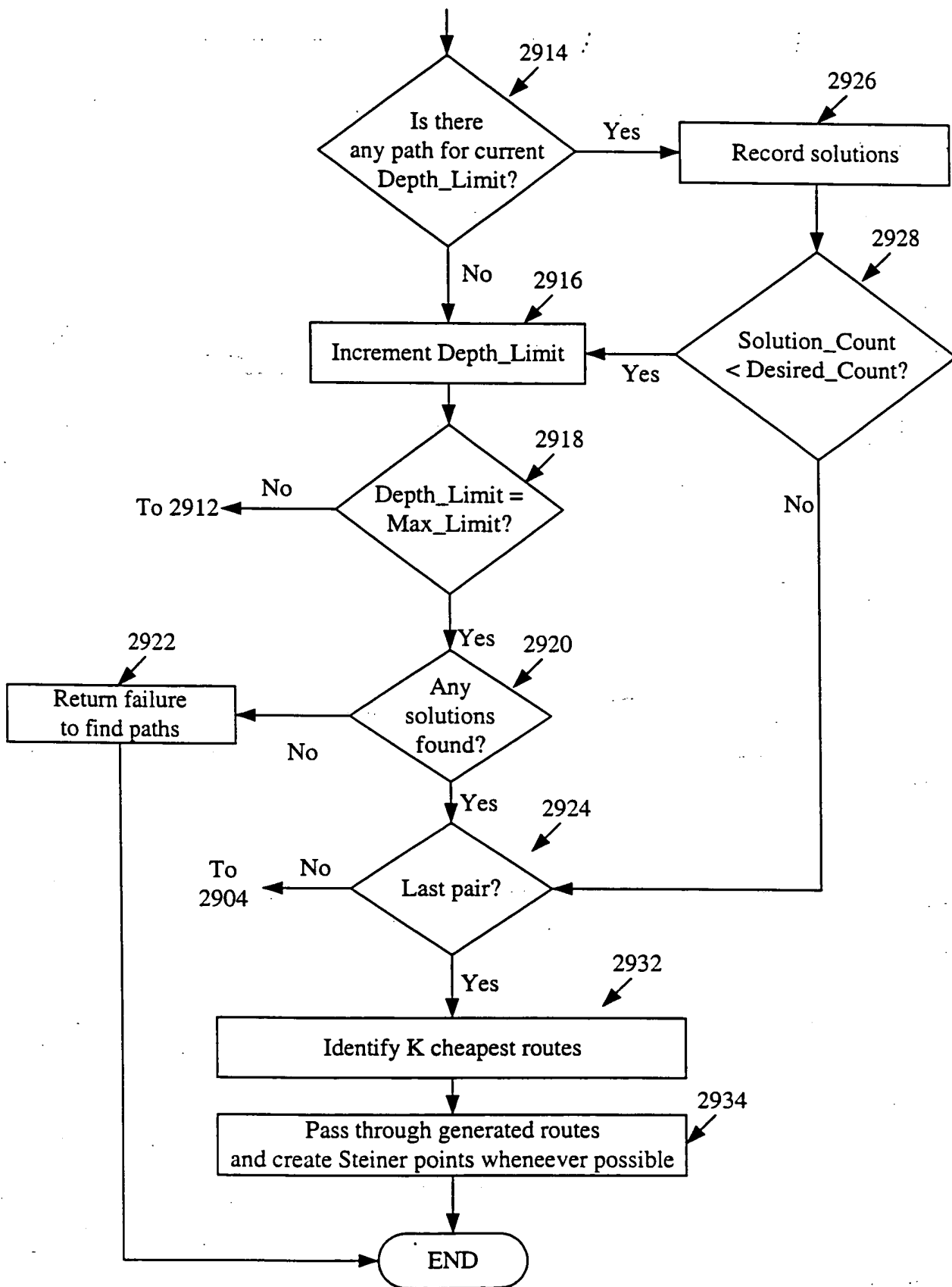
**Figure 28C**





**Figure 29A**

**Figure 29:**  $\frac{\text{Figure 29A}}{\text{Figure 29B}}$



**Figure 29B**

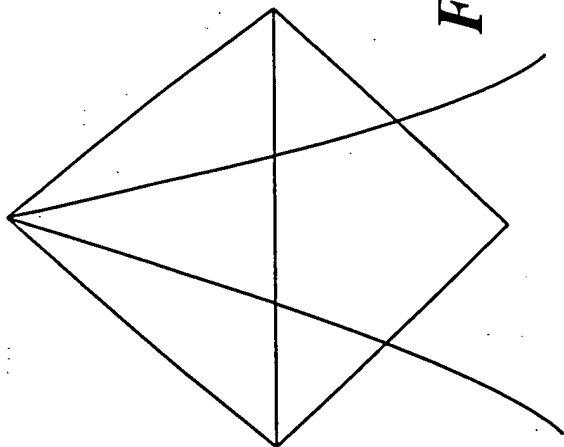


Figure 30A

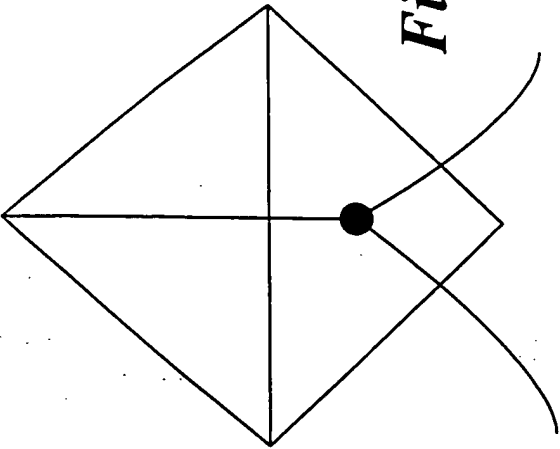


Figure 30B

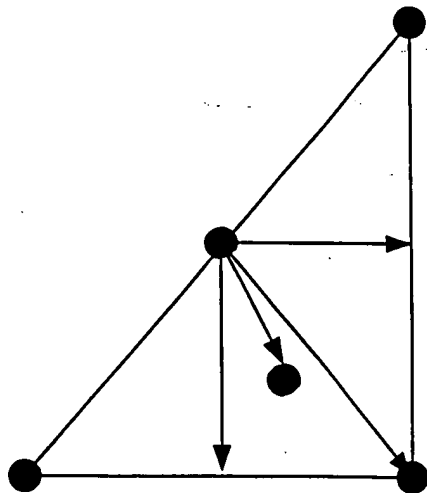


Figure 32

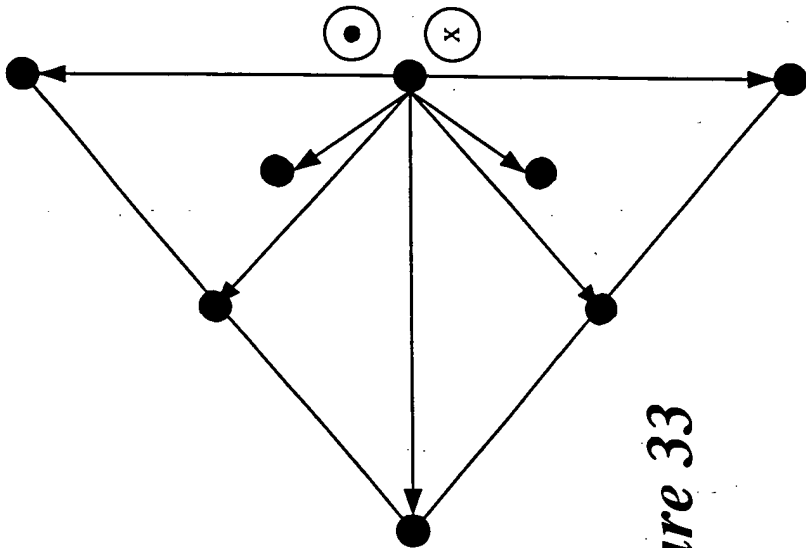


Figure 33

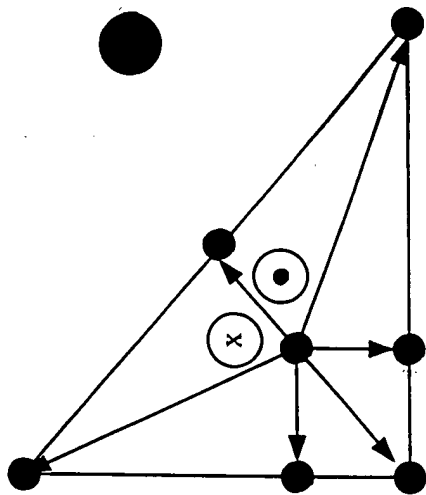
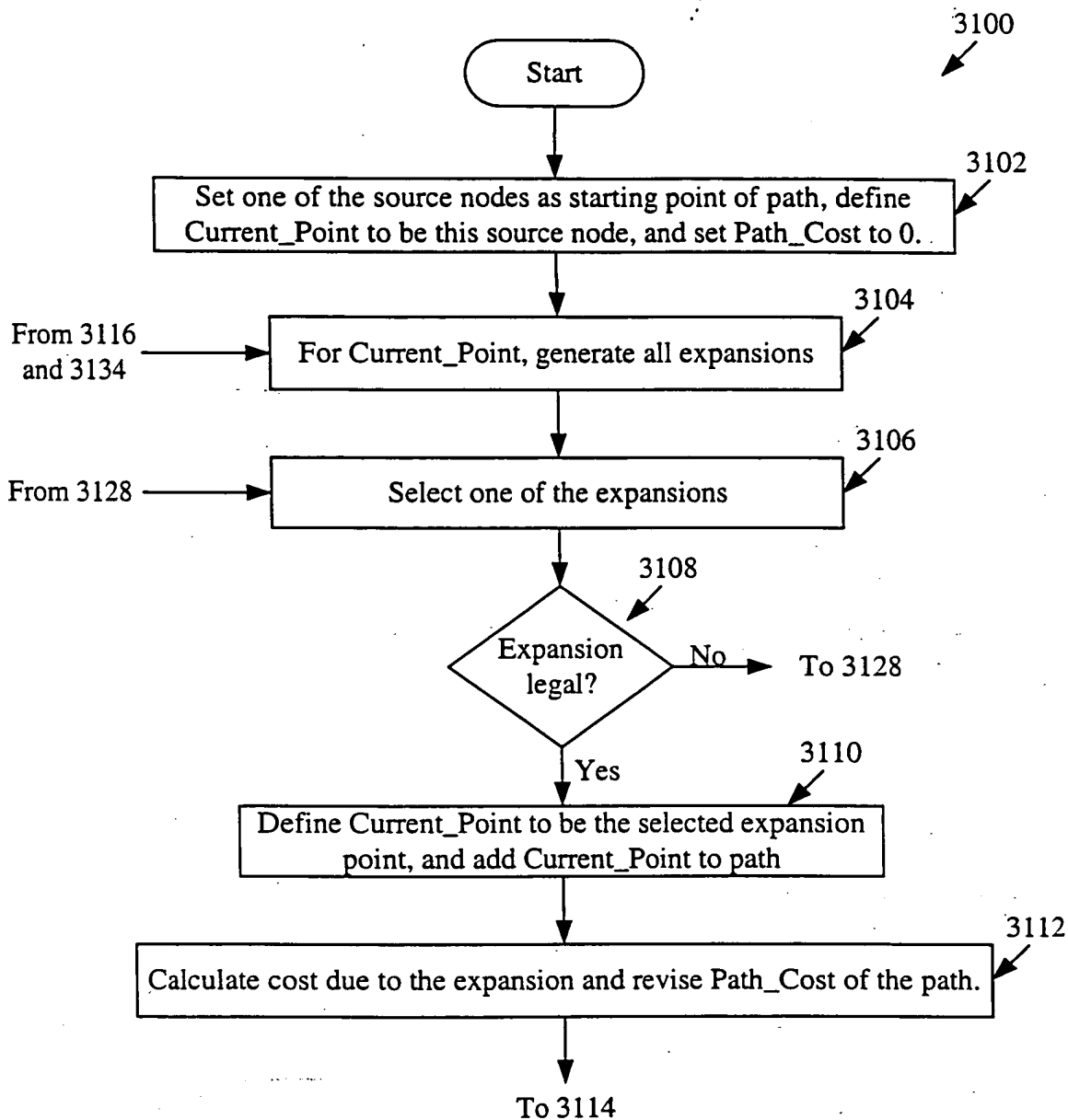
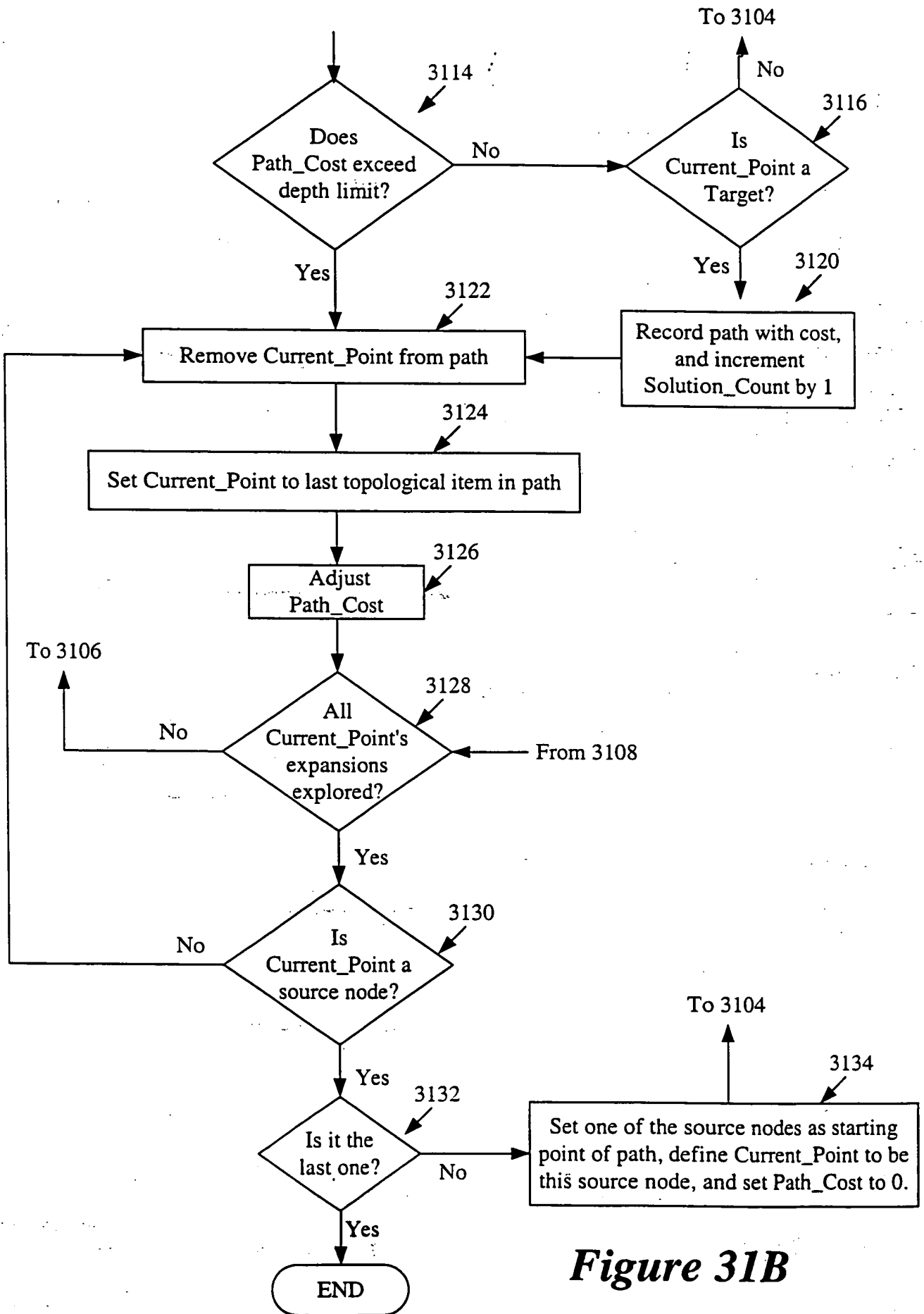


Figure 34



**Figure 31A**

**Figure 31:**  $\frac{\text{Figure 31A}}{\text{Figure 31B}}$



**Figure 31B**

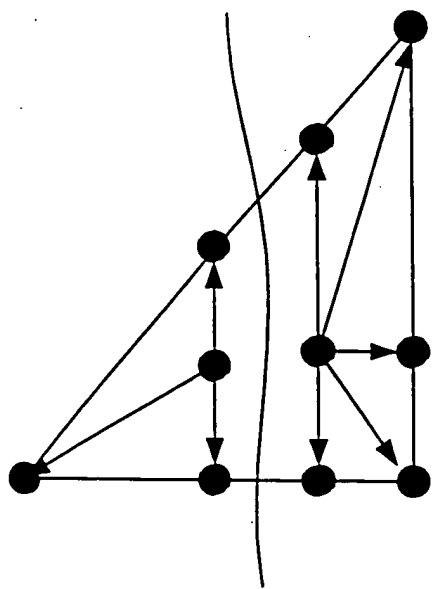


Figure 35

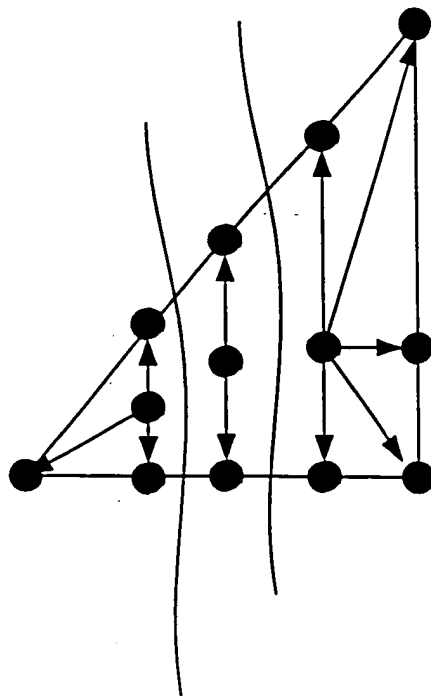


Figure 36

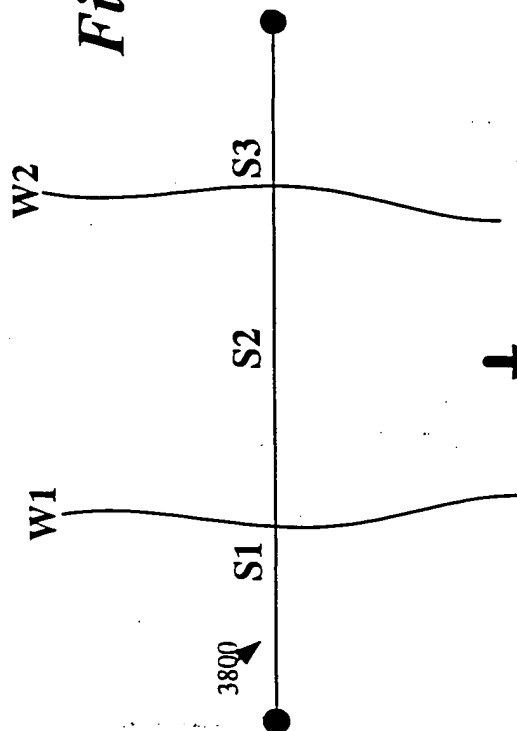


Figure 38A

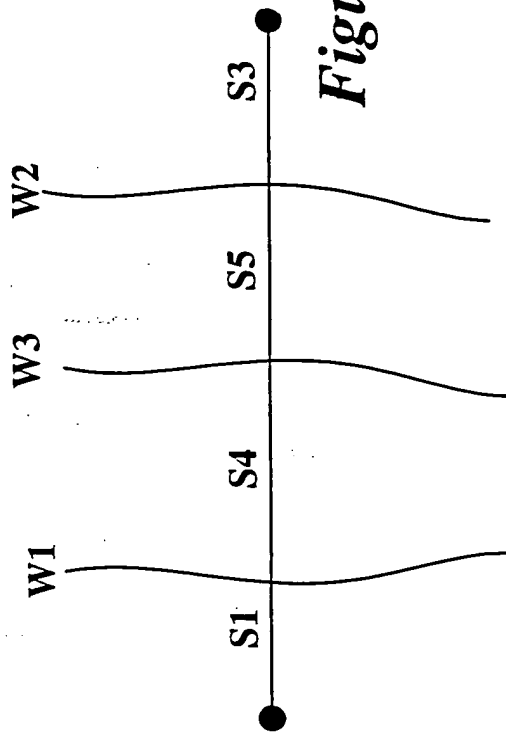
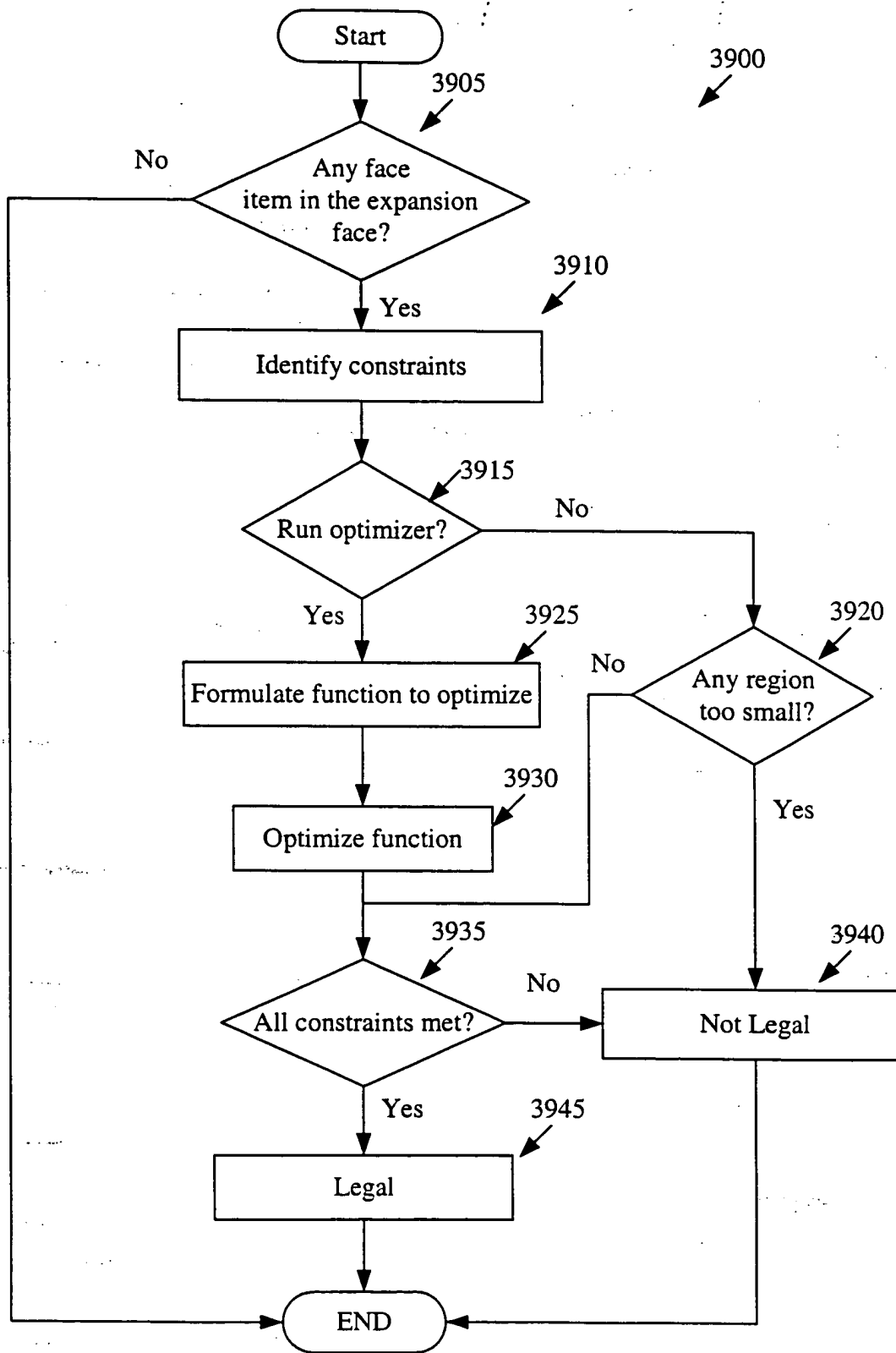


Figure 38B

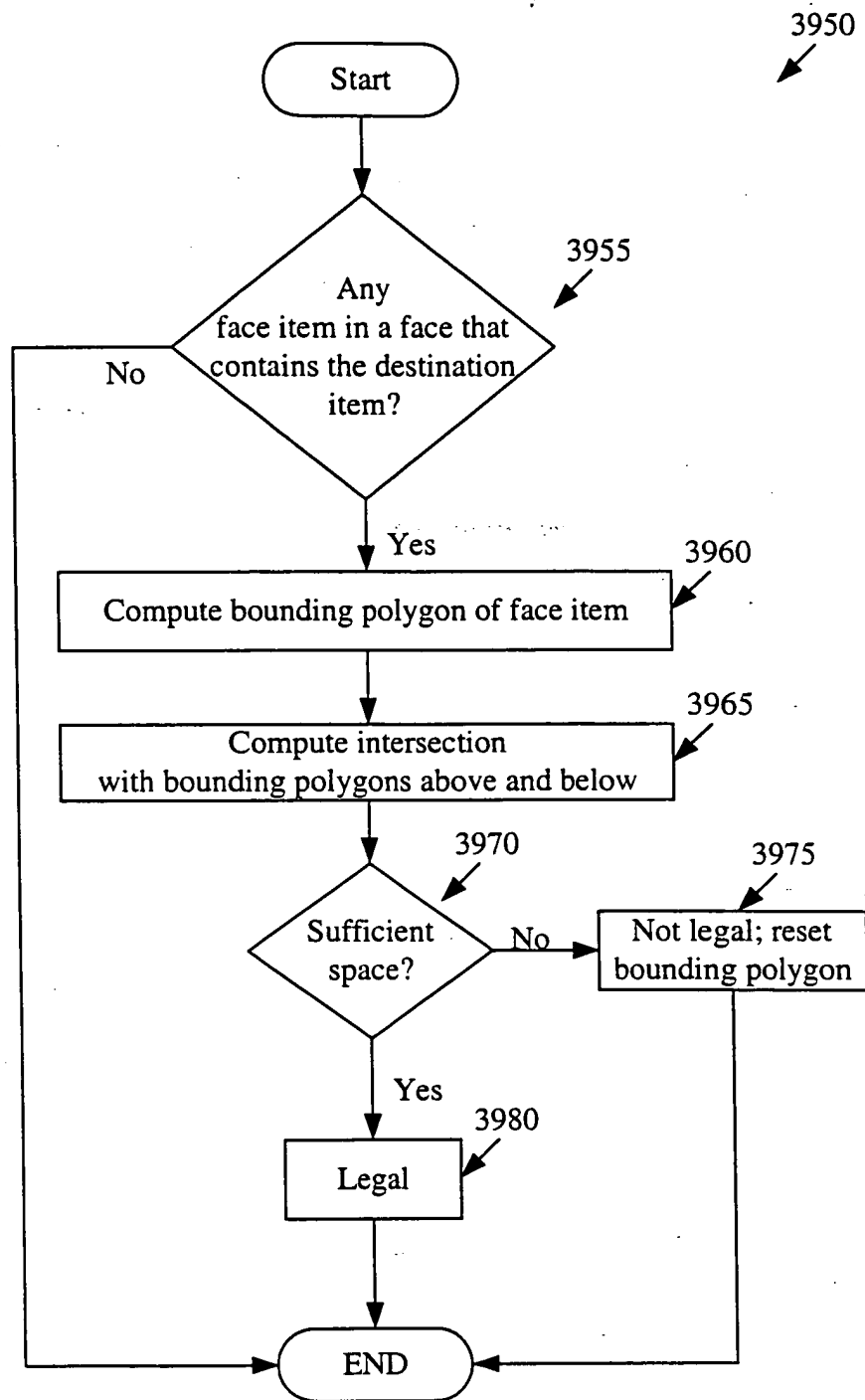
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From:	Node	<ul style="list-style-type: none"> <li>• Planarity</li> <li>• Vias</li> </ul>	<ul style="list-style-type: none"> <li>• Vias</li> </ul>	<ul style="list-style-type: none"> <li>• Planarity</li> <li>• Vias</li> <li>• Edge</li> <li>• Capacity</li> </ul>
	Face Item	<ul style="list-style-type: none"> <li>• Vias</li> </ul>	<ul style="list-style-type: none"> <li>• Vias</li> </ul>	<ul style="list-style-type: none"> <li>• Vias</li> <li>• Edge</li> <li>• Capacity</li> </ul>
	Edge Item	<ul style="list-style-type: none"> <li>• Planarity</li> <li>• Vias</li> </ul>	<ul style="list-style-type: none"> <li>• Vias</li> </ul>	<ul style="list-style-type: none"> <li>• Planarity</li> <li>• Vias</li> <li>• Edge</li> <li>• Capacity</li> </ul>

Figure 37



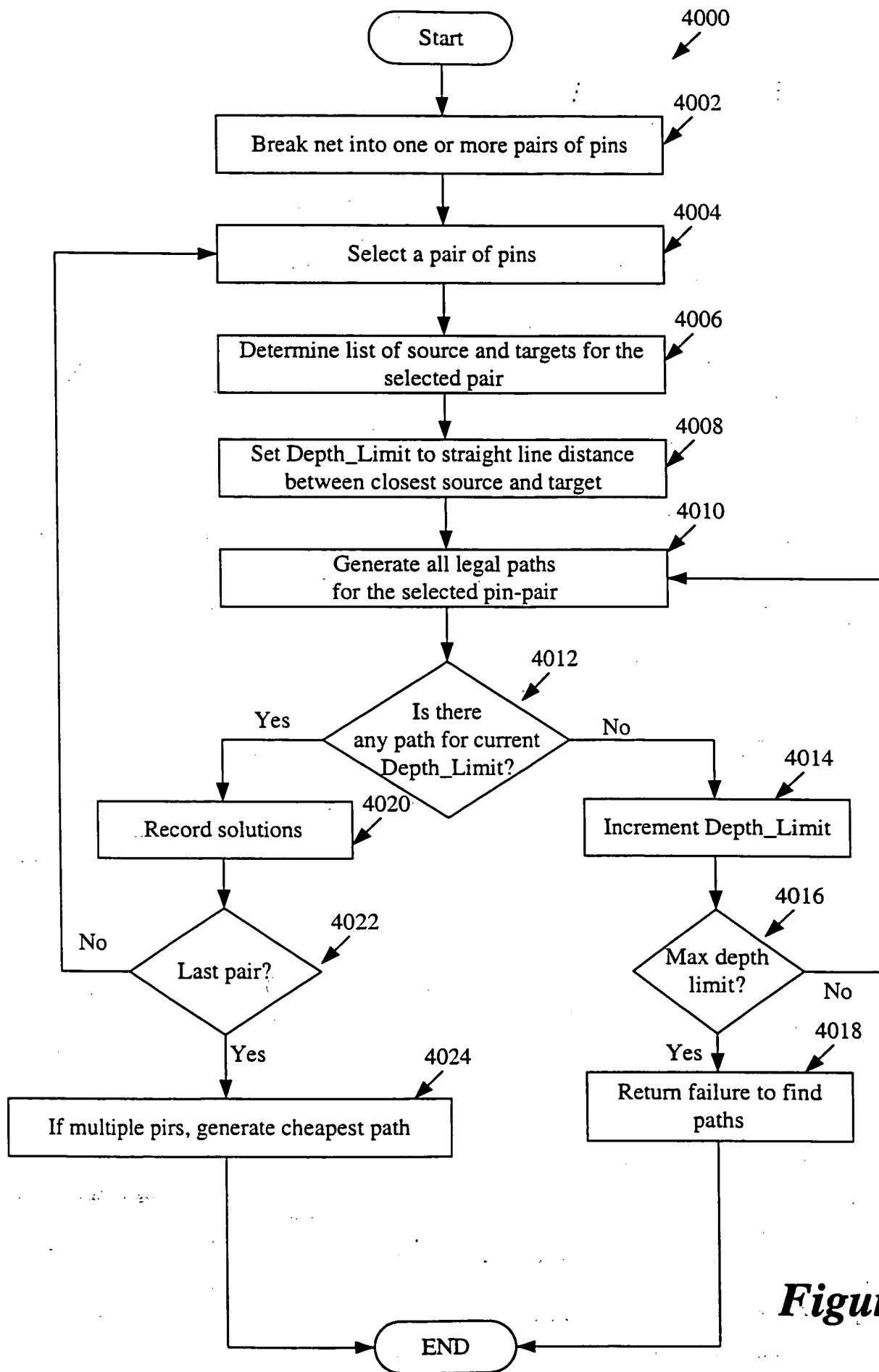
**Figure 39A**



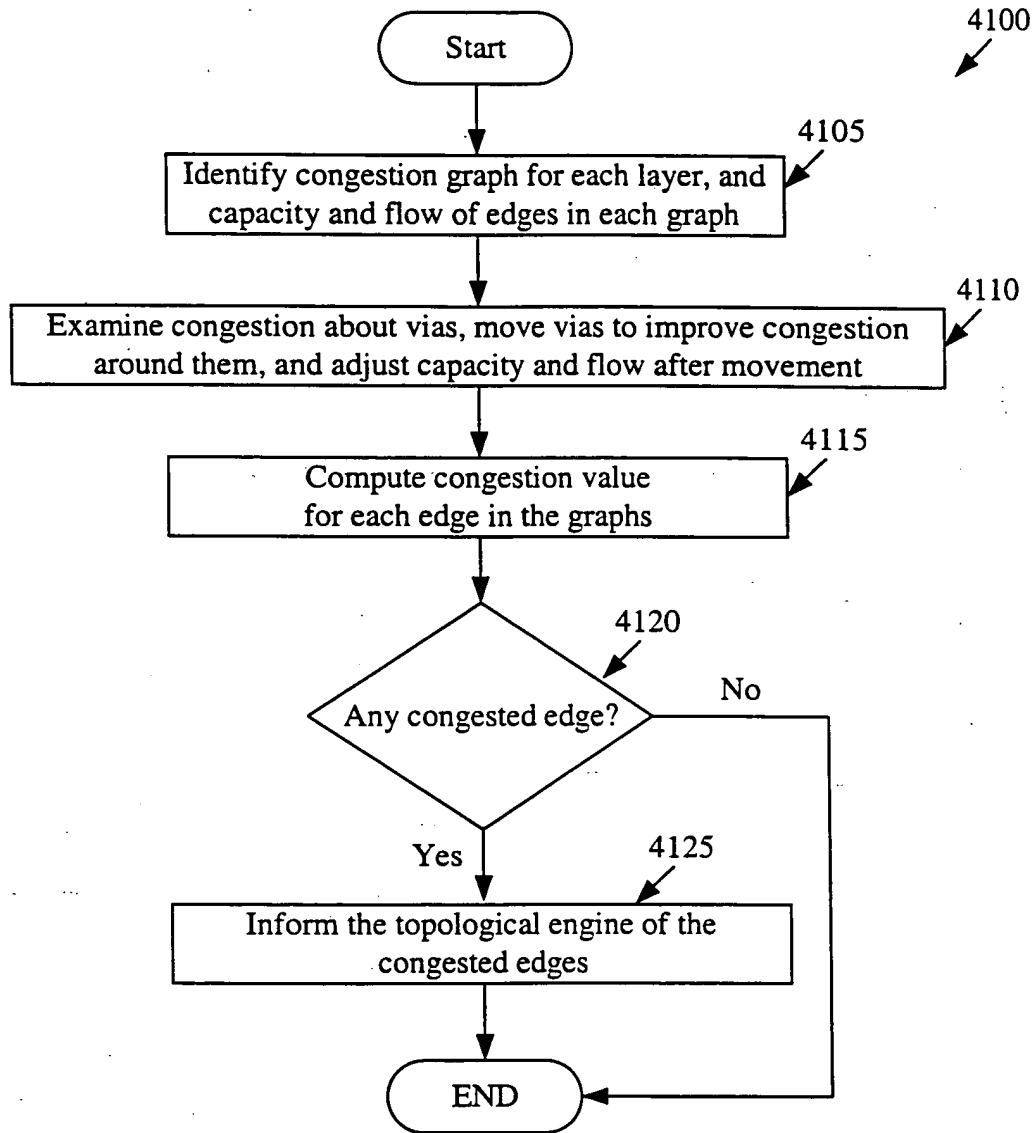


**Figure 39B**

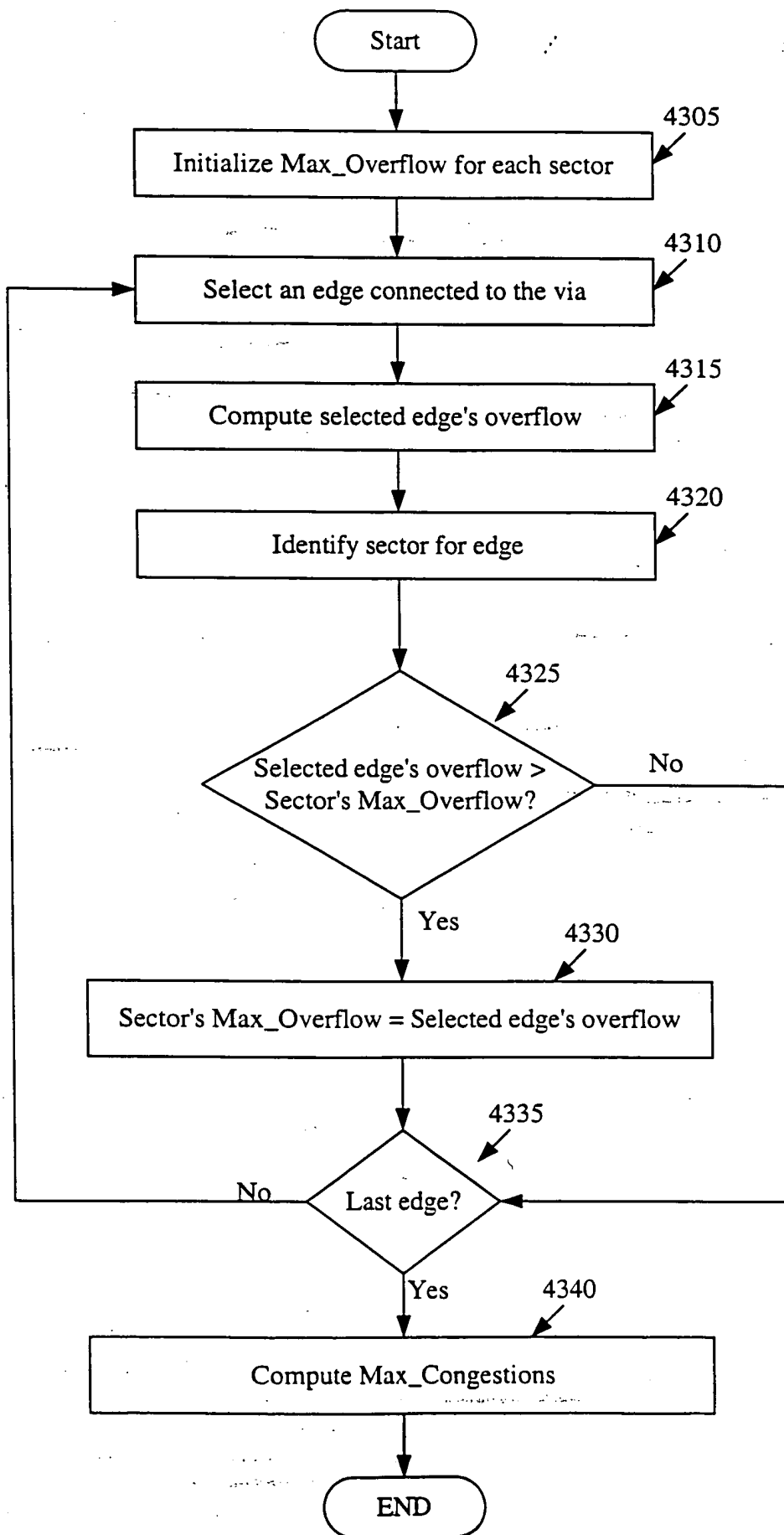
1005137-013106



**Figure 40**



**Figure 41**



**Figure 43**

Max\_Congestion2

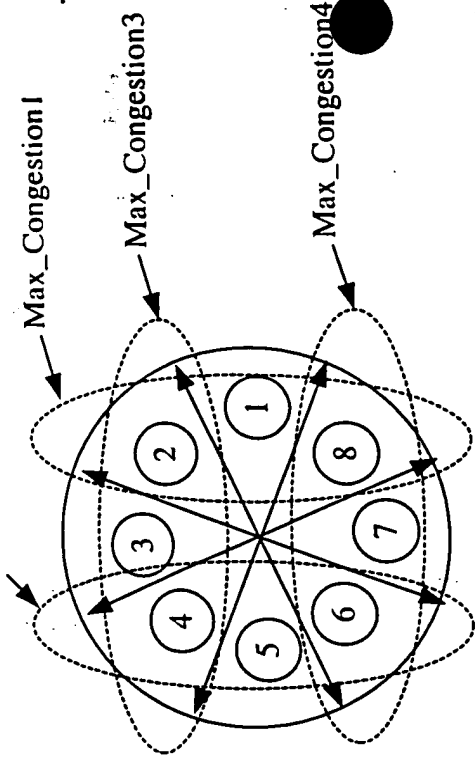


Figure 42

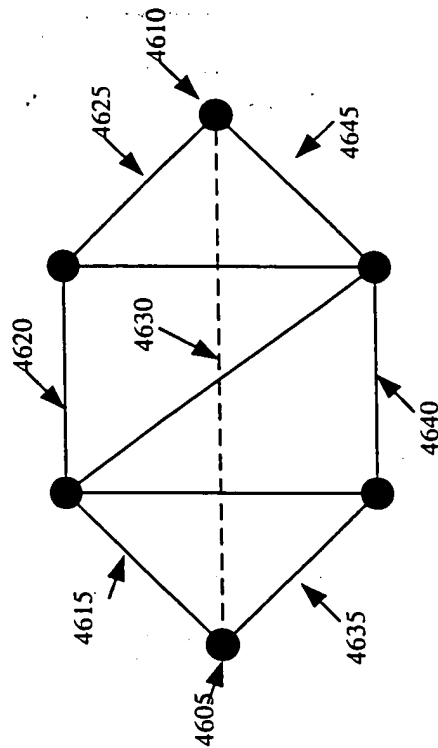


Figure 44

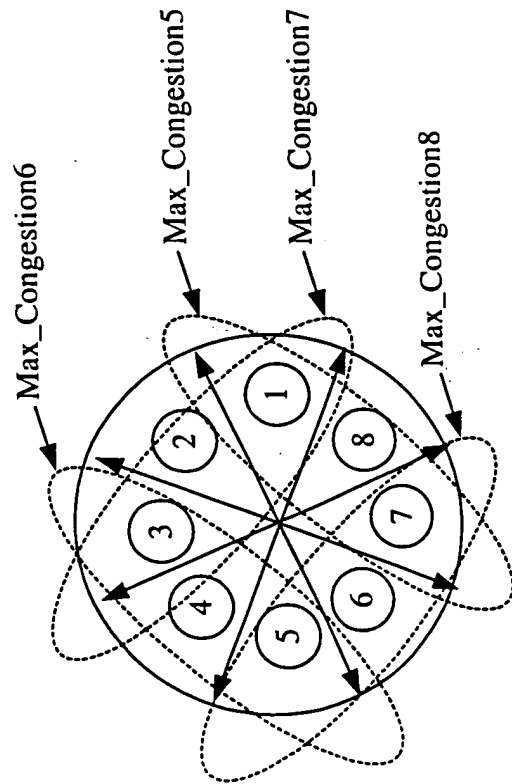


Figure 45

Figure 46

A hand-drawn diagram of a building layout, enclosed in a rectangular border. The diagram shows two rooms. The left room is labeled '4710' and contains a square. The right room is labeled '4105' and contains a square. The diagram is drawn with black lines on a white background.

FIGURE 47

200618/01310

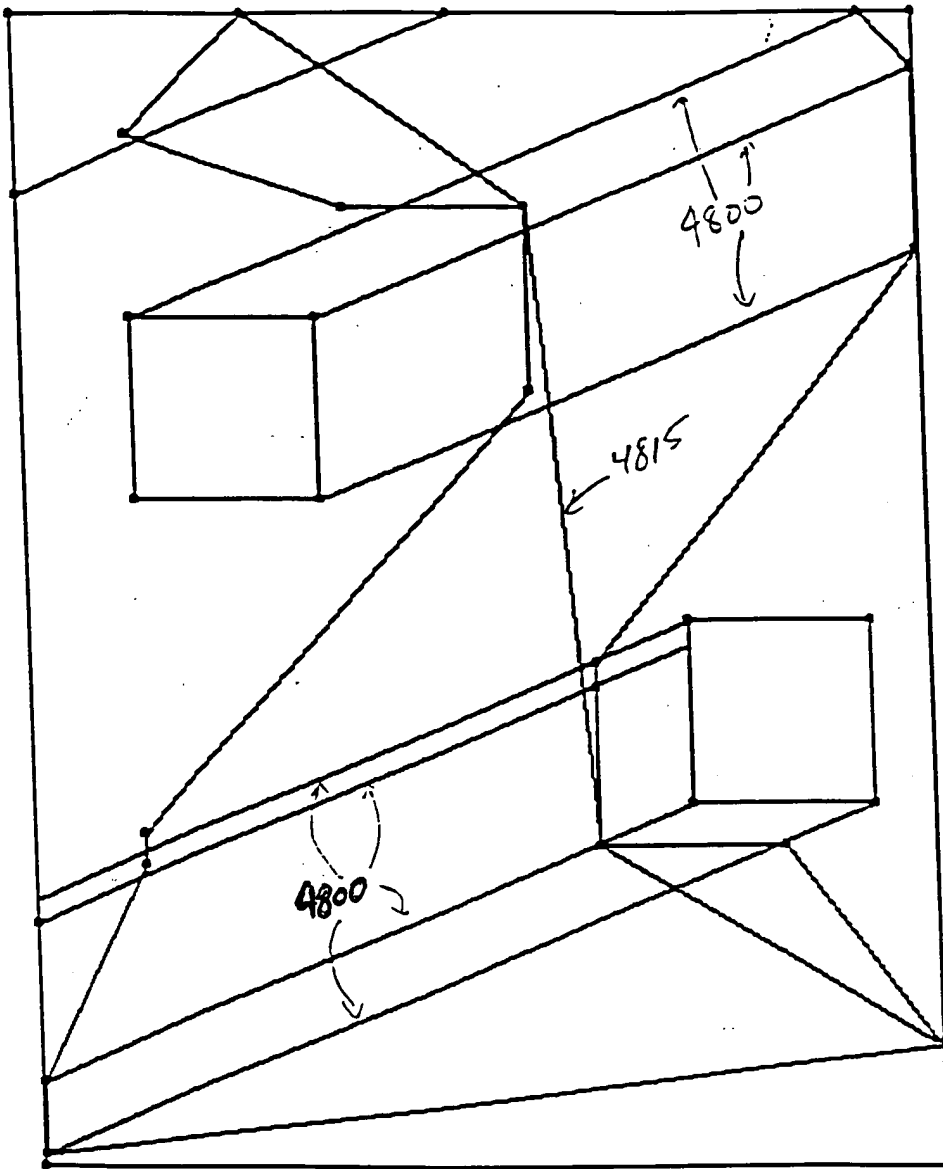


FIGURE 48A

10066187-013102

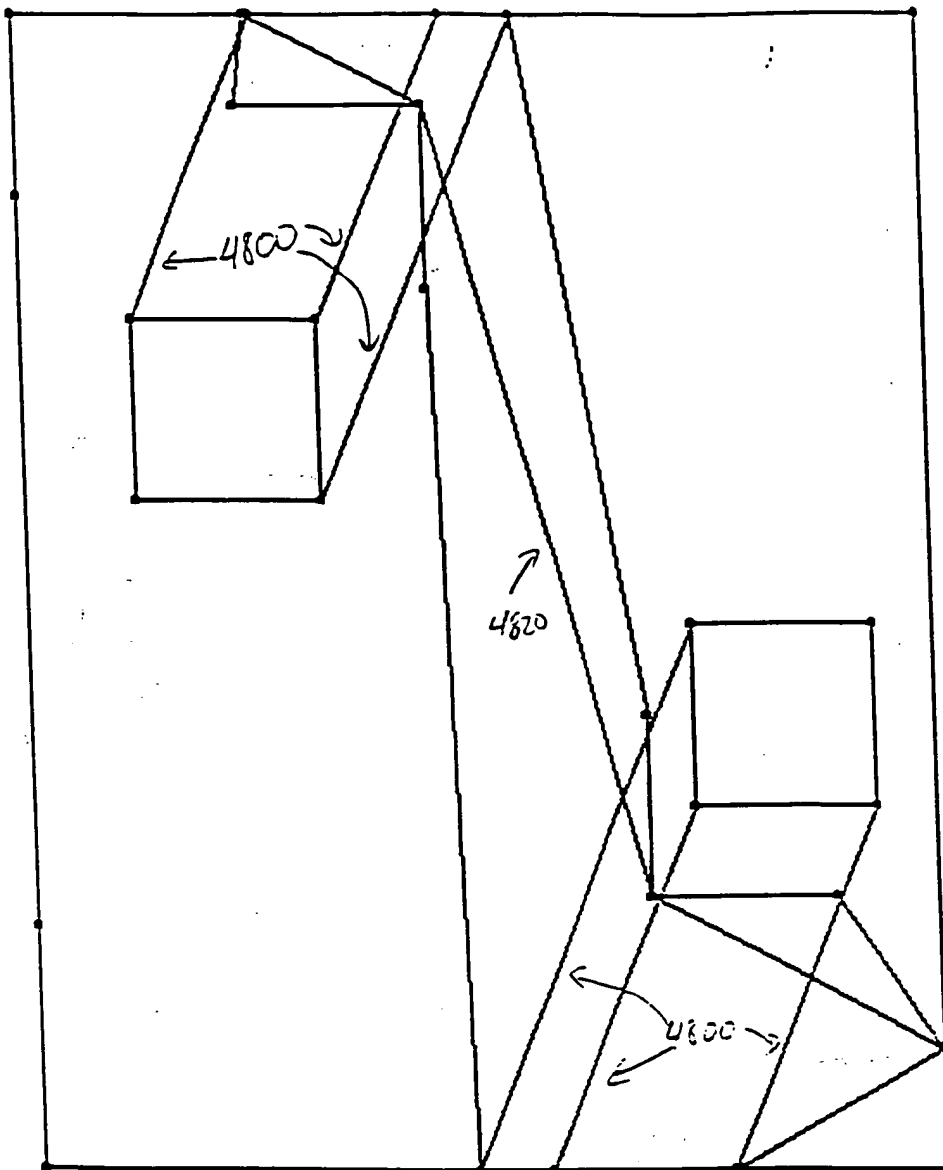


FIGURE 48B



10056187-013100

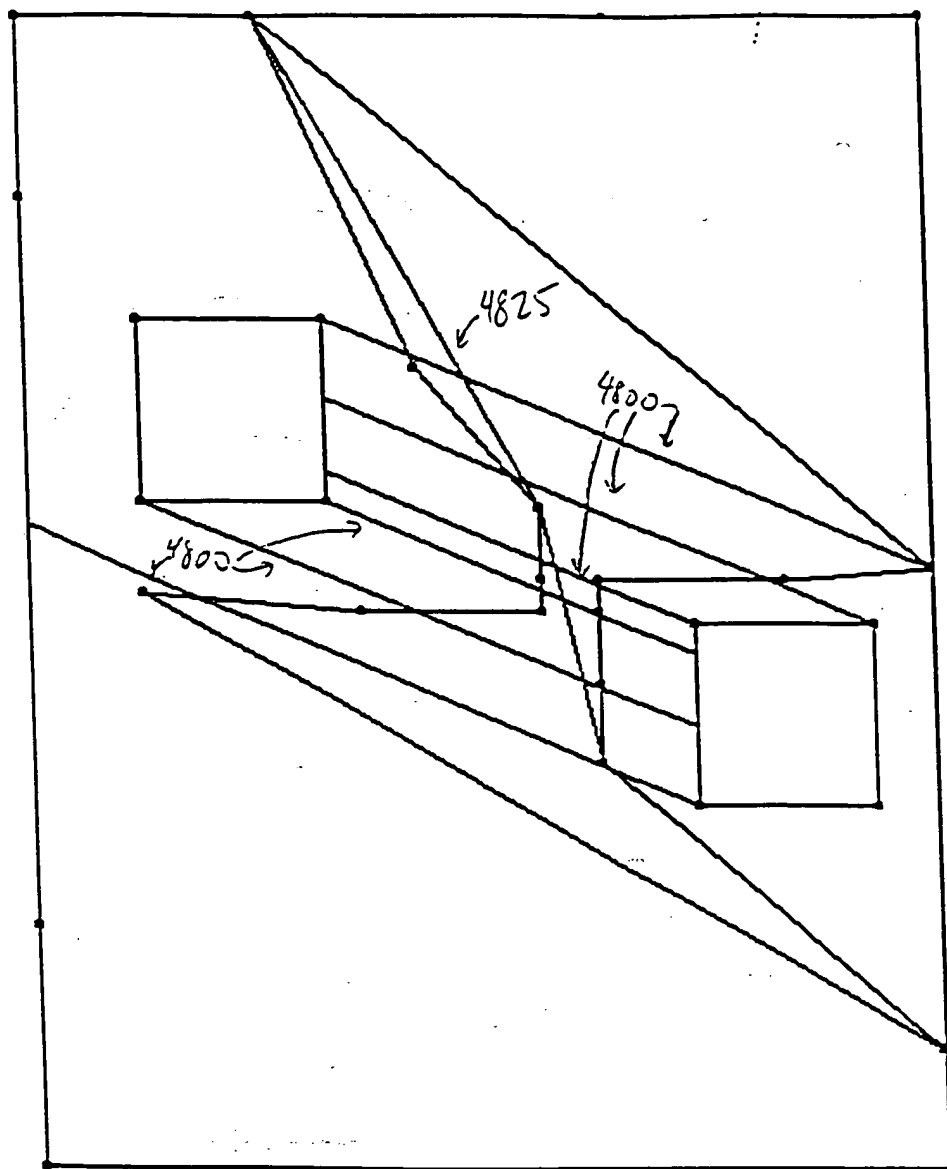


FIGURE 48C

10066187.013102

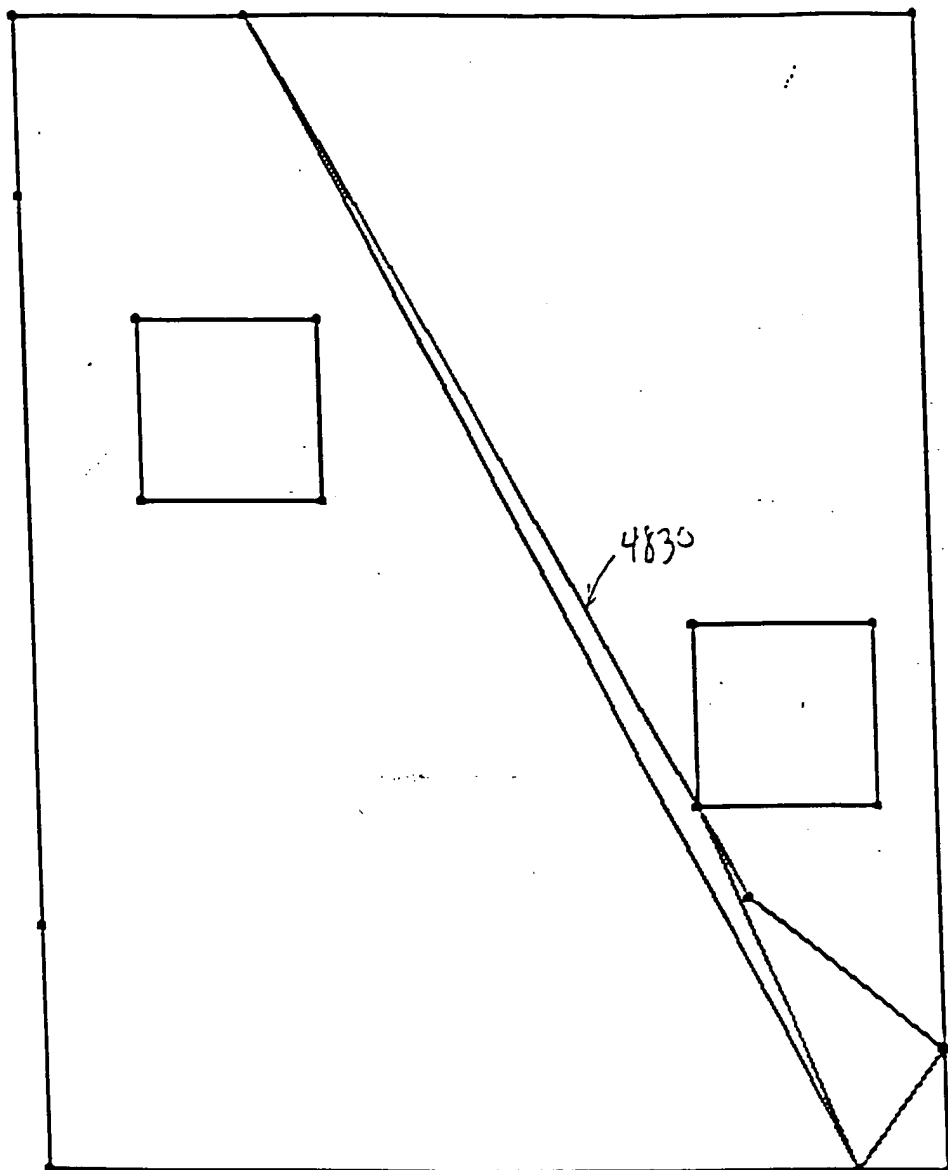


FIGURE 48D

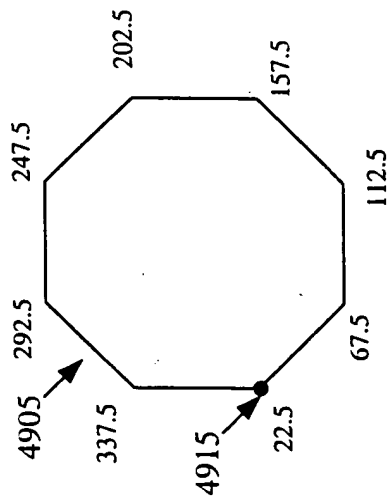


Figure 49A

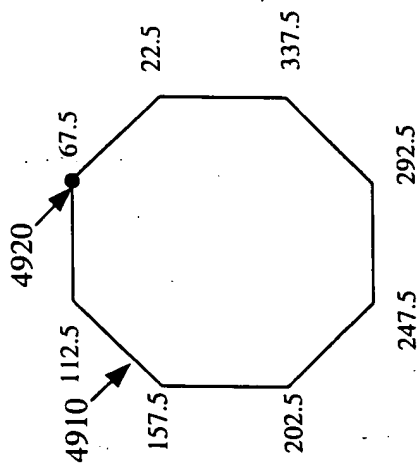


Figure 49B

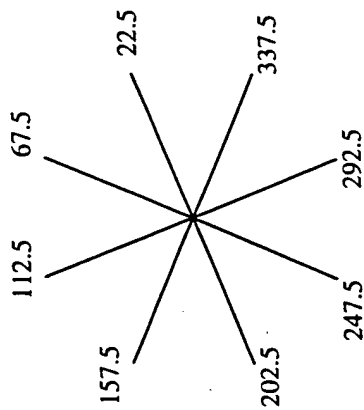


Figure 49C

10056187-013102

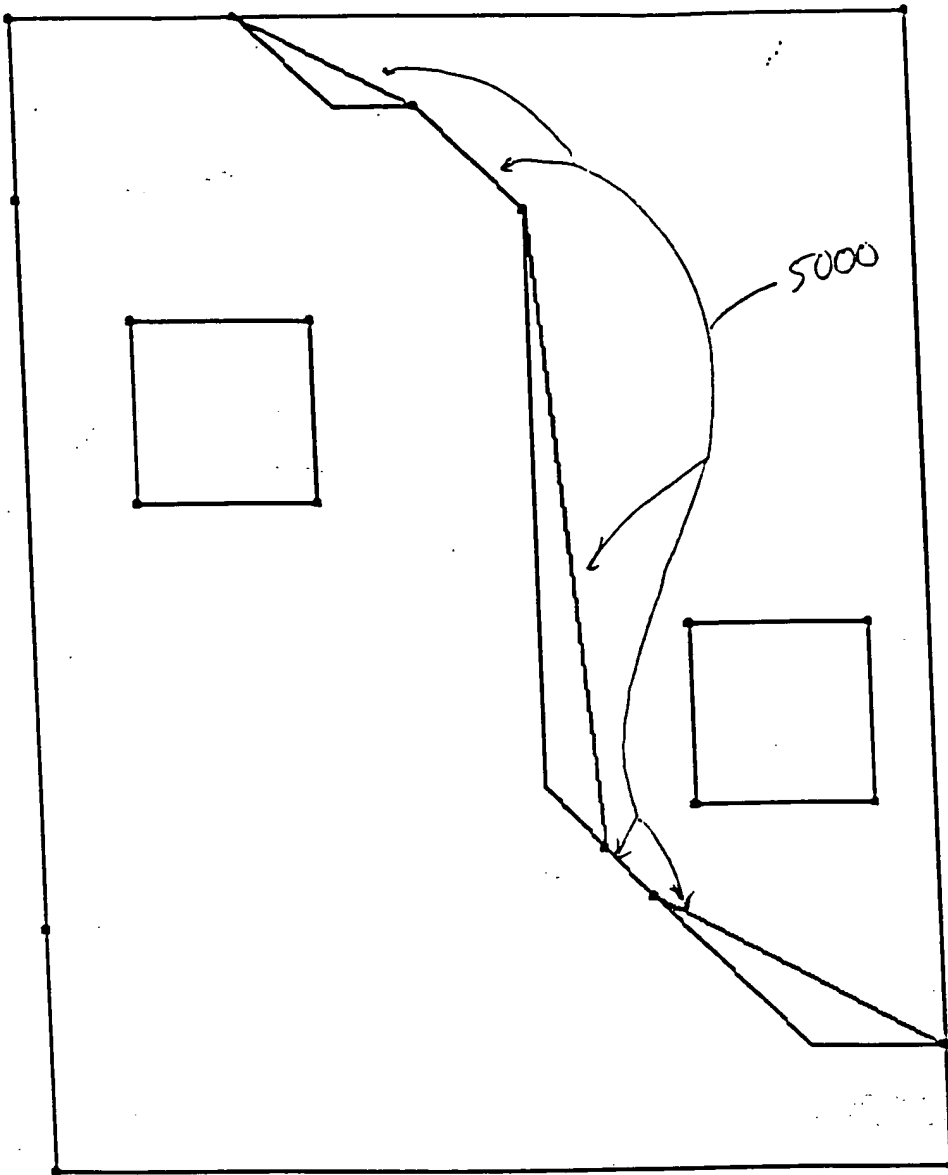


FIGURE 50

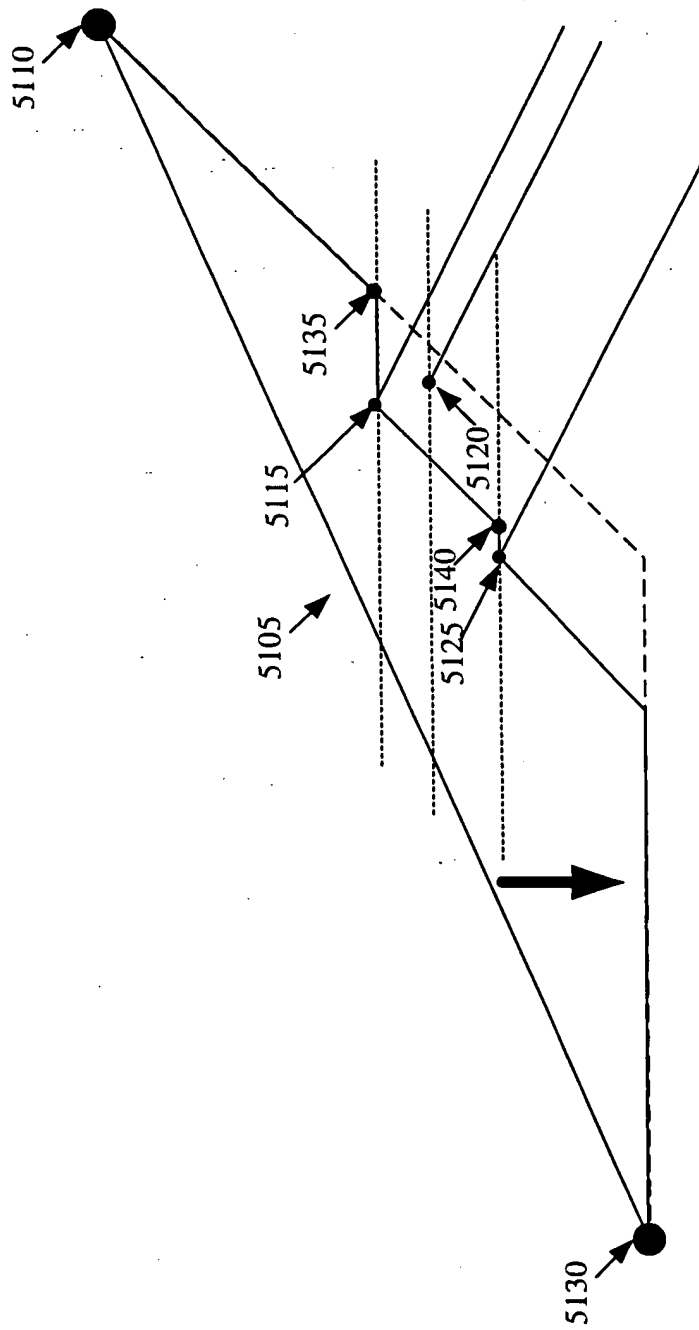
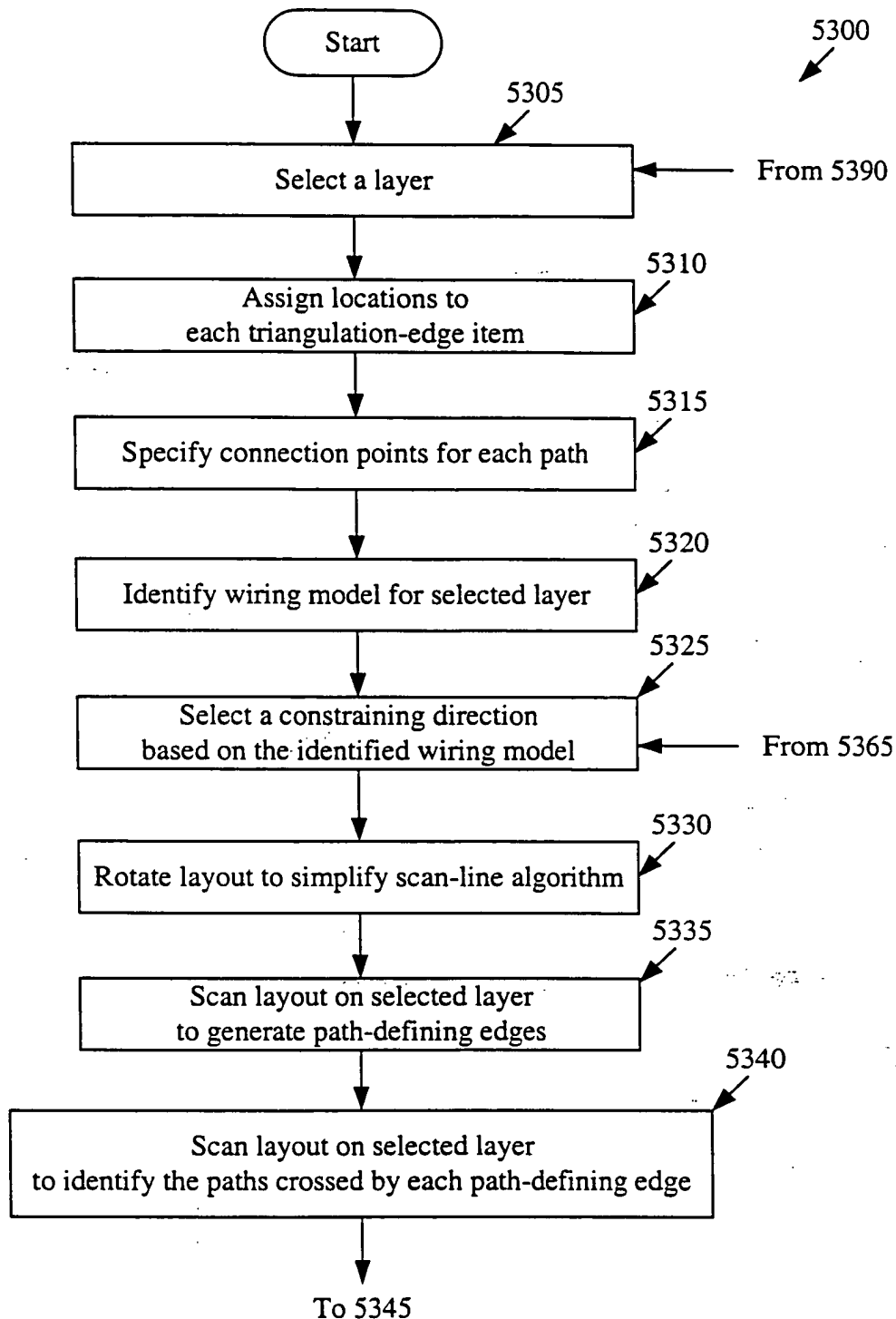


Figure 51

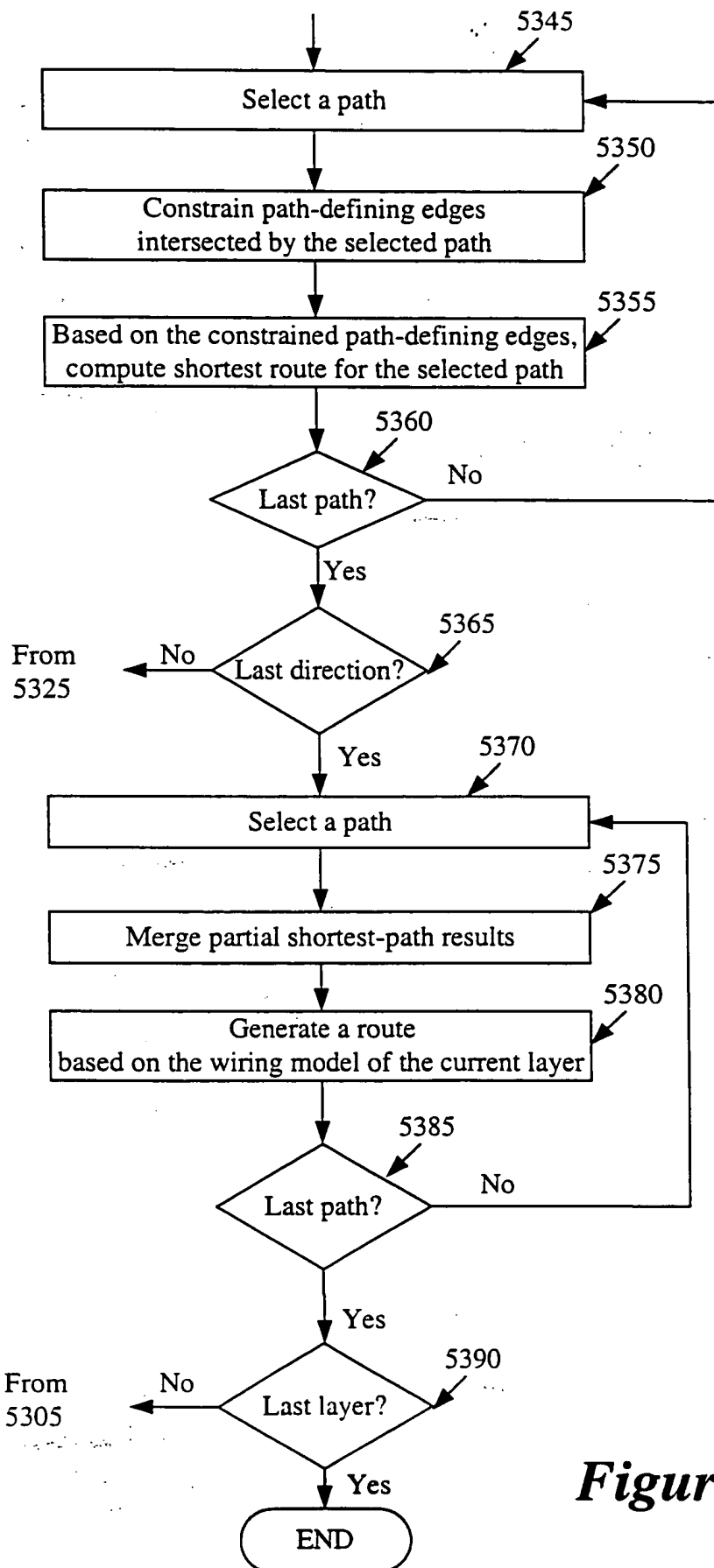
[illegible]

FIGURE 52



**Figure 53**

**Figure 53:** Figure 53A  
Figure 53B



**Figure 53B**



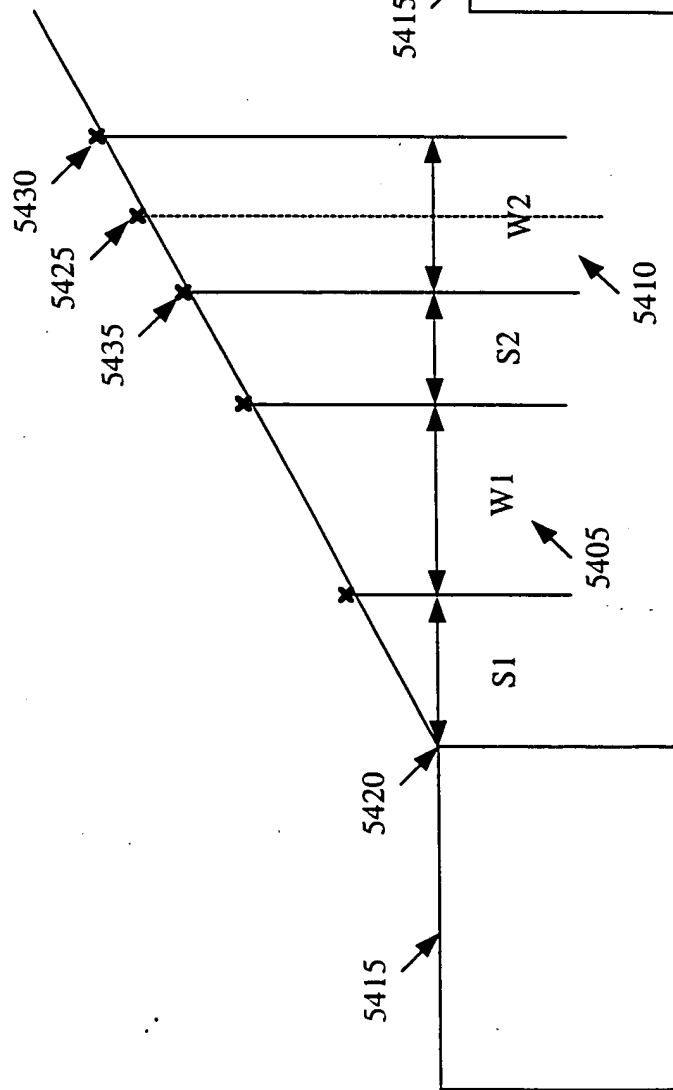


Figure 54

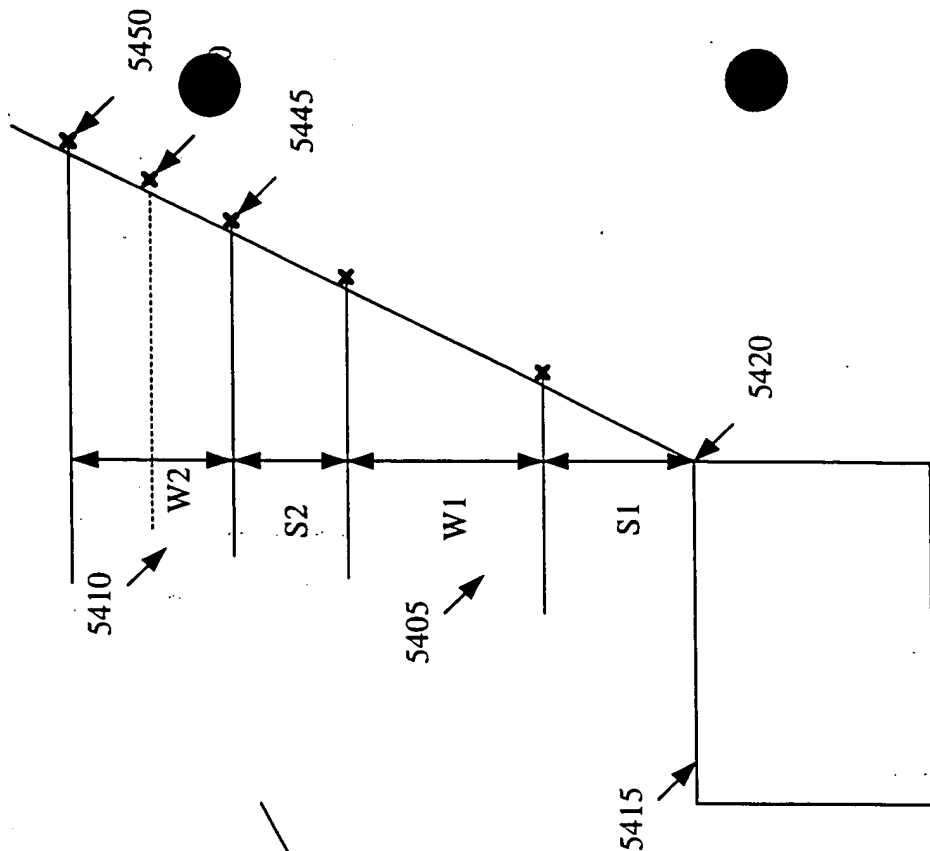


Figure 55



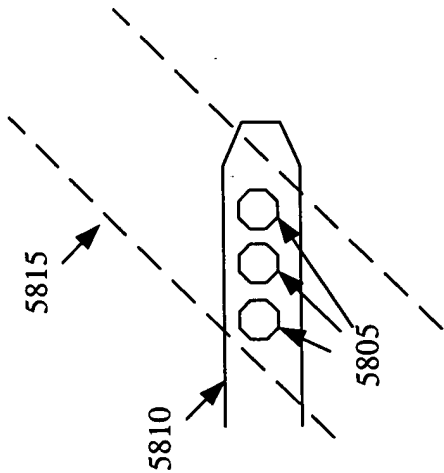


Figure 58

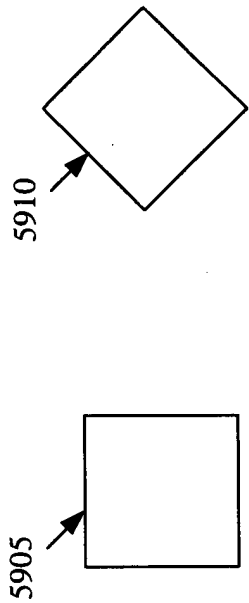


Figure 59

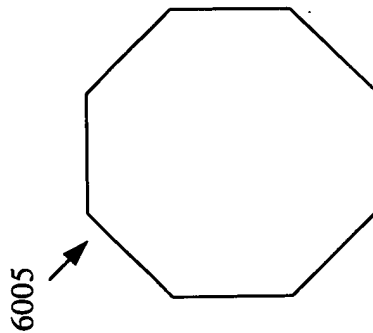


Figure 60

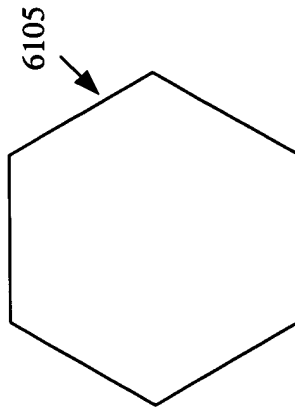


Figure 61

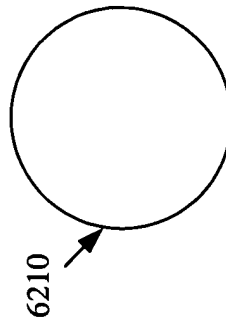
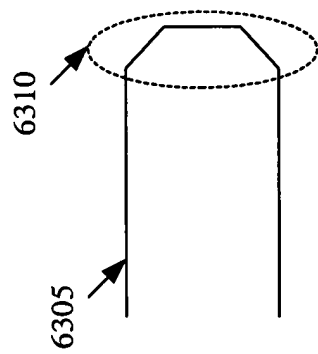
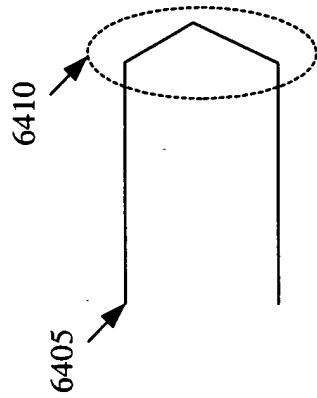


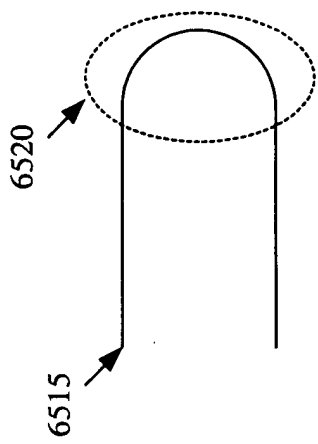
Figure 62



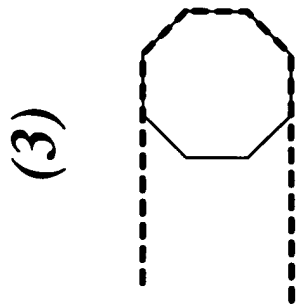
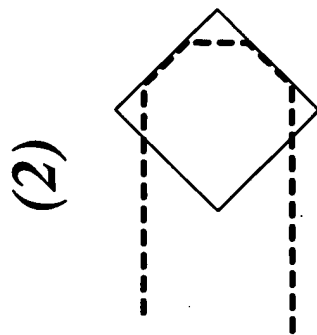
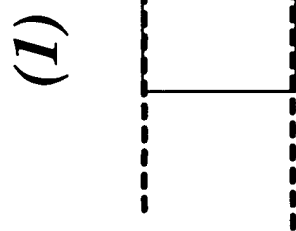
**Figure 63**



**Figure 64**



**Figure 65**



**Figure 66**



Figure 67

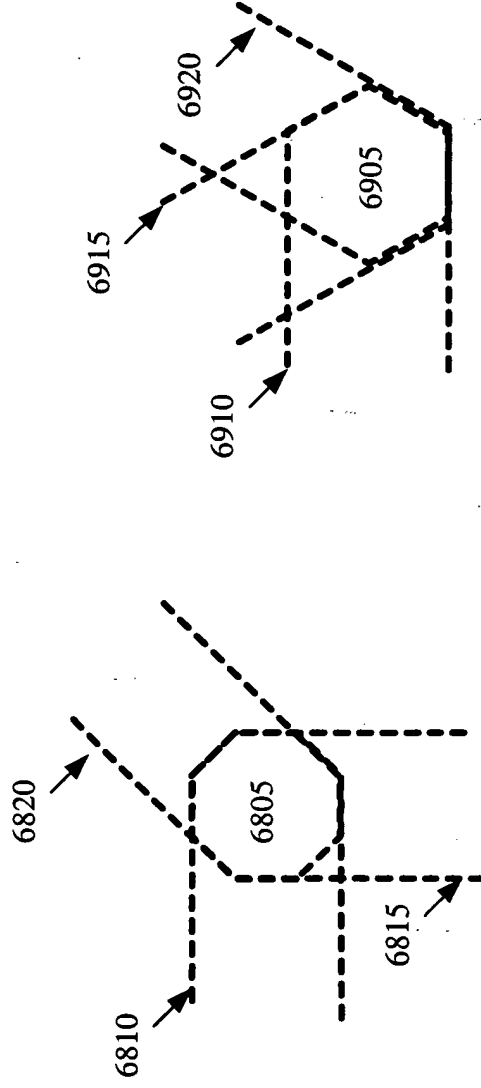


Figure 68

Figure 69

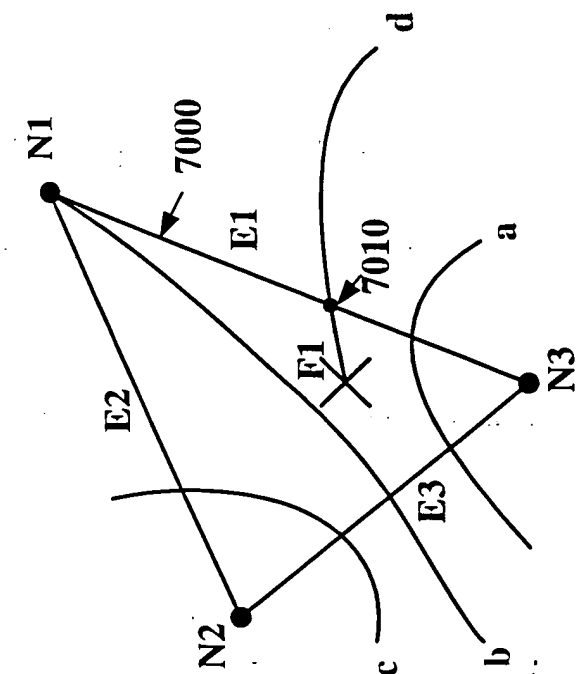


Figure 70

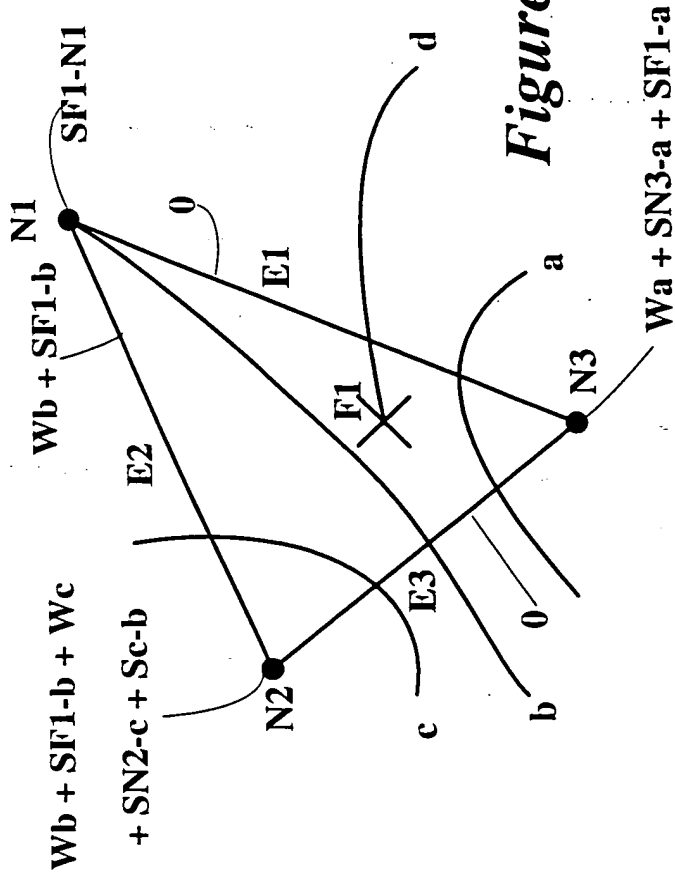


Figure 71

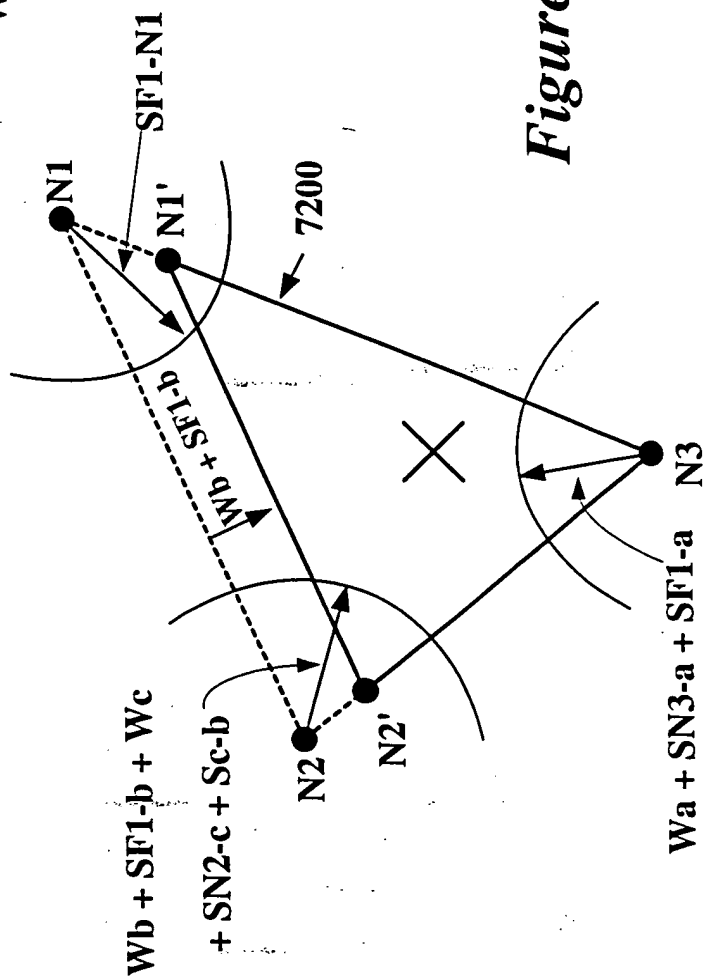
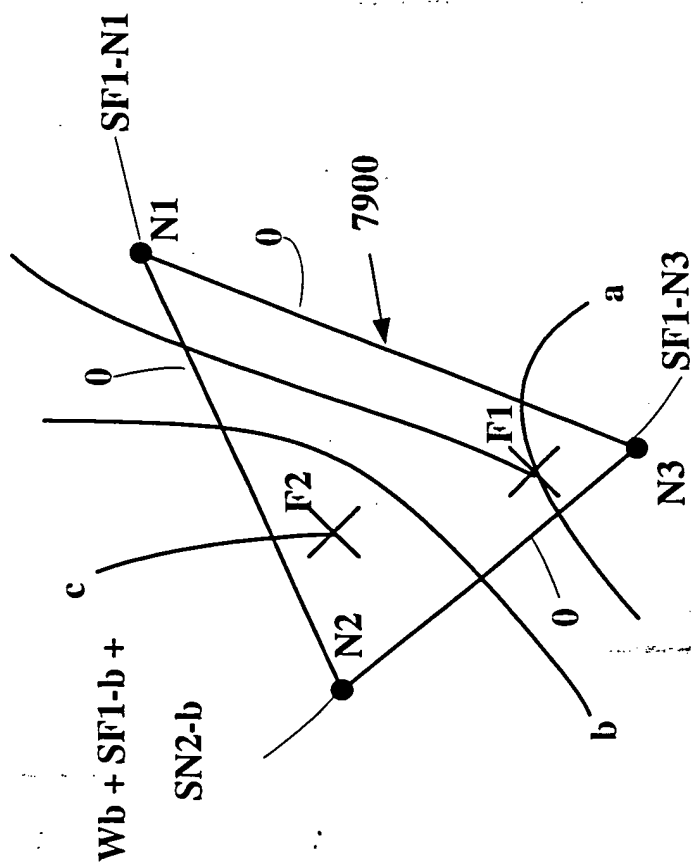


Figure 72

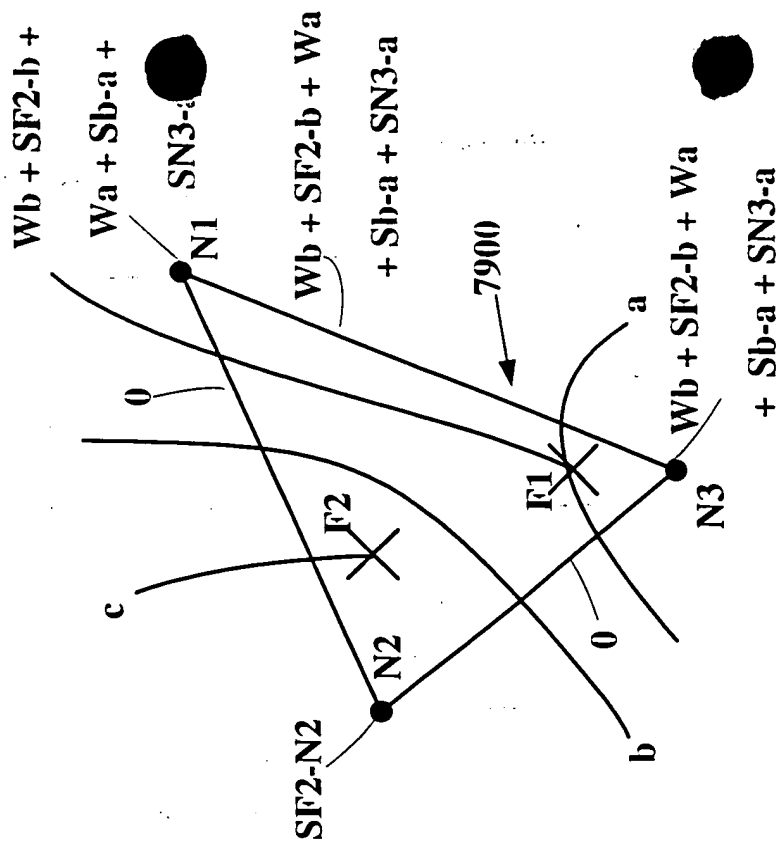








**Figure 79**



**Figure 80**

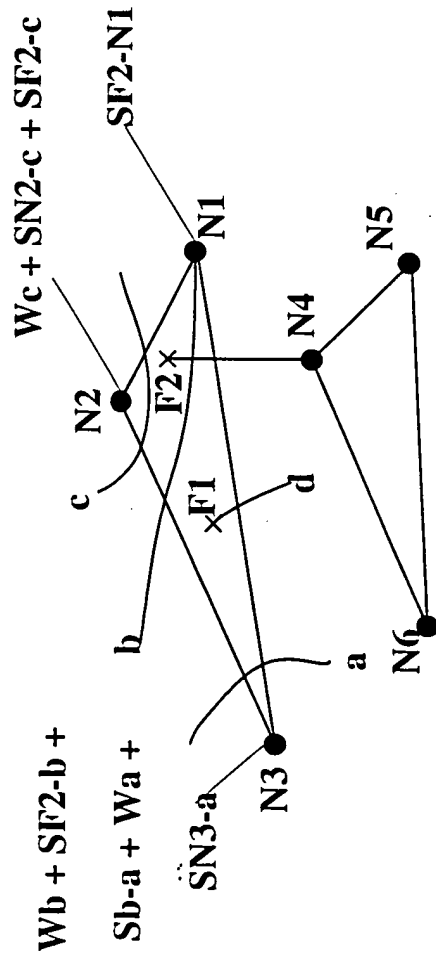


Figure 81

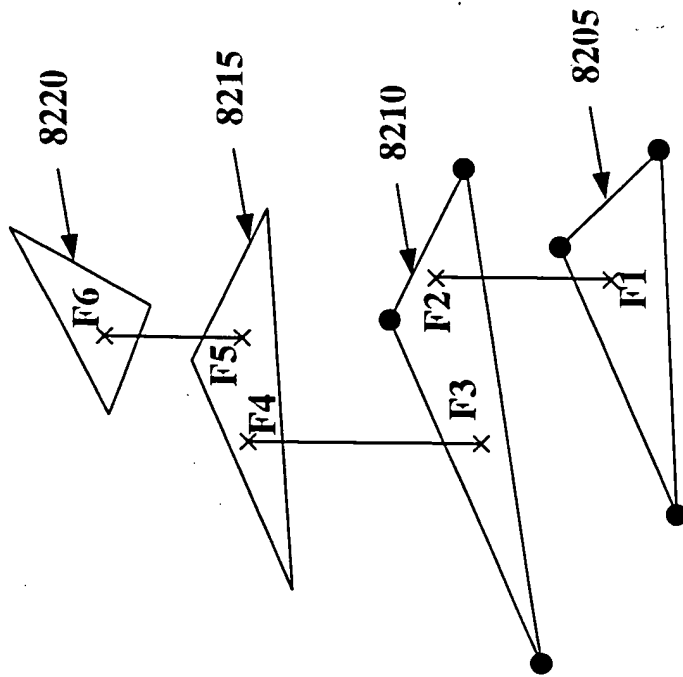


Figure 82

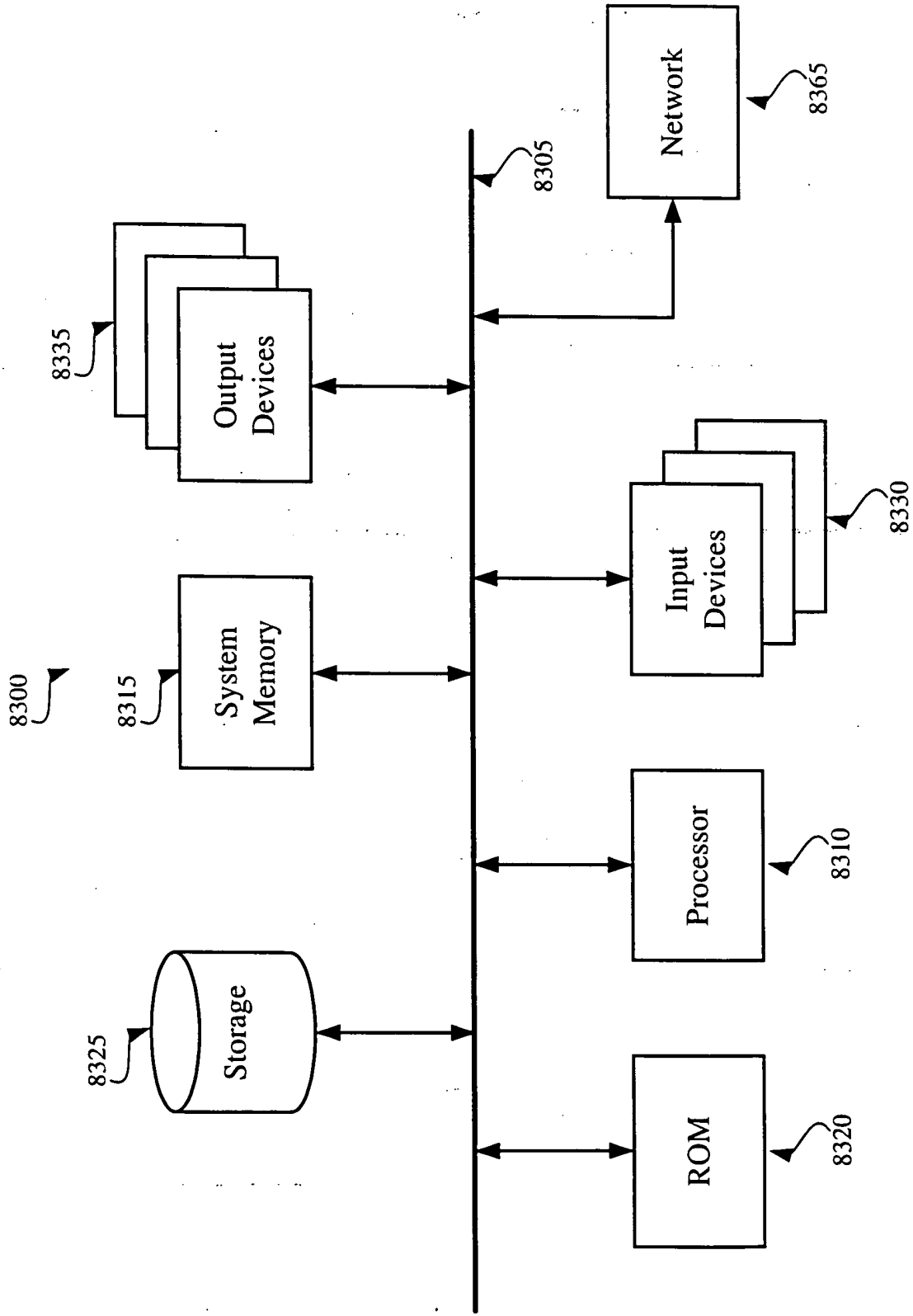


Figure 83